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RESPONSE OF PREGNANT WOMEN AND THEIR INFANTS TO POLIOMYELITIS VACCINE

DISTRIBUTION OF POLIOVIRUS ANTIBODY IN PREGNANT WOMEN BEFORE AND AFTER VACCINATION—TRANSFER, PERSISTENCE, AND INDUCTION OF ANTIBODIES IN INFANTS

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Sixty-five per cent of unvaccinated pregnant women lacked antibodies to one or more poliovirus types, according to neutralization tests on serum done with HeLa cell cultures. Two injections of formalinized poliomyelitis vaccine given during pregnancy reduced the incidence of incompletely protected women to 18%. The infant at birth usually showed passively acquired antibodies at a level equal to or slightly below that of his mother, eliminated half of the antibodies in about five weeks after birth, and retained measurable amounts of antibodies for [illegible] *natal periods proportional to* [illegible] *received at birth. On* [illegible] *injections of* [illegible] *one* [illegible]

THE NEWLY BORN human or animal infant demonstrably has capacity to acquire passive immunity against toxins, bacteria, and viruses after injection of the corresponding antigen into the mother during pregnancy. Poliovirus antibodies were first shown to be passively transferred from the human mother to her infant by Aycock and Kramer in 1930.[1] Since that time passively transmitted maternal immunity has been recognized as a factor in the resistance of newborn children to poliomyelitis.[2]

It has been suggested that placentally transferred passive immunity to poliomyelitis can be converted to active immunity by subclinical infection during the phase of declining protection by maternal antibody. Such induction of active immunity could partially explain the low frequency of poliomyelitis epidemics in most tropical and subtropical countries,[3] a frequency, however, which seems to increase as socioeconomic and hygienic conditions improve in these areas.

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The present study was designed (*a*) to determine the incidence by titer of naturally occurring poliovirus antibodies in pregnant women; (*b*) to compare the antibody response of pregnant women to formalinized (Salk) poliomyelitis vaccine[4] administered subcutaneously or intradermally; (*c*) to measure naturally occurring and vaccine-induced poliovirus antibodies passively transferred from mother to infant and the persistence of maternal antibodies in the infant; and (*d*) to evaluate the response to poliomyelitis vaccine of infants without previous actively immunizing experience.

Materials and Methods

The studies begun at the University of Minnesota in May, 1955, through combined efforts of the departments of bacteriology and immunology, obstetrics and gynecology, and pediatrics and the School of Public Health were made possible by voluntary participation of 188 pregnant women registered for obstetric care at the University of Minnesota Hospitals. The average patient age was 26.7 years (range, 17-42); about two-thirds of the group were private patients.

TABLE 1.—*Percentage Distribution of Poliovirus Antibodies by Immunotype and Titer Among 186* Pregnant Women Before Vaccination (Naturally Occurring) and 136 Pregnant Women After Two Injections† of Poliomyelitis Vaccine*

	Antibodies, Type					
	Naturally Occurring			After Vaccination		
Titer Level	1	2‡	3	1*	2	3
4,096 or greater	2.7	4.3	1.6	15.7	25.0	21.3
1,024	4.3	11.3	7.0	22.4	22.8	24.3
256	13.5	15.0	15.6	13.4	21.3	19.8
64	12.9	15.6	17.2	18.7	16.2	8.8
16	21.0	9.1	11.3	11.9	12.5	11.8
4	10.7	13.4	7.5	6.7	1.5	3.7
Not measurable (<4)	34.9	32.3	39.8	11.2	0.7	10.3

* Two serum specimens lost.
† Given subcutaneously or intradermally.
‡ One serum specimen not analyzed for type 2.

cimens.—Samples of maternal blood for anti- y were obtained by antecubital fossa veni-; infant blood was withdrawn from the jugular vein.

titative Assay of Poliovirus Neutralizing dy.—For antibody assays, HeLa cell cultures prepared and rinsed as previously recom- ded[5] for application of the dispersed cell tech- que to use of mammalian cells in continuous culture. Test serums diluted 1:4 in yeast extract m (YEM)[6] were inactivated at 56 C for 30 lly diluted fourfold in YEM supple- ken or monkey serum and maintenance, and tubes per were calculated to destroy 50% of the culture tubes inoculated. Serum tests, including those with appropriate cell and serum controls, were assayed with 100 tissue culture infective doses ($TCID_{50}$) of poliovirus types 1-3 according to titers determined on each day of testing. When primary serum dilutions (1:4) were inactive, titers were classified as "not measurable."

Results

Distribution of Poliovirus Neutralizing Antibody in Pregnant Women.—Serum specimens representative of 186 of the 188 pregnant women participating in the study were successfully assayed for neutralizing antibody. Distribution of "naturally occurring" poliovirus antibodies in these women prior to reception of any poliomyelitis vaccine is shown by titer in table 1. No antibodies to any type of poliovirus were detected in serums (1:4) from 11.3% of the group. Antibodies to one or two types were present in 53.6%. Antibodies to all three types of poliovirus were detected in serums from 35.1% of the group. Therefore, 65% of these women were incompletely protected by antibody. Only a small number of the women exhibited antibody titers equal to or exceeding 1,024.

Response of Pregnant Women to Poliomyelitis Vaccine.—Subsequent to the 1955 poliomyelitis season in Minnesota, 138 pregnant women participated in a study program of immunization with Salk vaccine prepared in three lots by two commercial manufacturers. Approximately 50 women were injected with each lot; half of the group received a smaller amount of the vaccine intradermally (two doses of 0.2 ml. given three to four weeks apart) rather than the usual larger amounts subcutaneously (two doses of 1.0 ml. given three to four weeks apart) used for the remainder of the group. Since spontaneous abortions usually occur before the 16th week of pregnancy, no initial injection was given to the mother before this time, as calculated from the last menstrual period. This precaution reduced the possibility of the patient associating vaccine administration with abortion if such should have occurred. Further, no initial injection was given after the 30th week of pregnancy, so as to permit maximum antibody response to the second injection before delivery. Blood samples were collected immediately before the first injection and approximately four weeks after the second. With very few exceptions, all injections were performed by the same investigator (K. A. P.). Intradermal injections of 0.1 ml. of vaccine into the skin of the flexor surface of each forearm were given. By this technique, a total of 0.4 ml. of vaccine was administered intradermally, in contrast to the 2.0 ml. given utaneously. Assays were completed on serums of 133 of the original 138 partici- tion among the 133 va fore follows: antibody titer to virus of all types, 33.1%; to that of one or two types, 58.6%; and to that of no type, 8.3%. After two injections of poliomyelitis vaccine, 82% of the women responded with measurable antibody titers to all three poliovirus types. Complete failure of antibody response occurred with 18% of the women. These figures indicate that 73% of the women previously without complete antibody protection developed measurable antibody to all three poliovirus types after two injections of Salk vaccine. Frequency of pregnant women responding with antibody titers of 1,024 or greater was increased significantly for each poliovirus type (table 1).

In women with measurable antibody titers before and after vaccination (table 2) vaccine given intradermally elicited as satisfactory an antibody response as vaccine given in larger amounts subcutaneously. However, a greater proportion of pregnant women vaccinated intradermally failed to respond measurably to one or more poliovirus types, in contrast to the proportion of women so responding when subcutaneously vaccinated (table 2).

Transfer of Poliovirus Antibody from Mother to Infant and Persistence of Transferred Antibody in Infants.—At delivery of the studied mothers, a third specimen of maternal blood and a sample of cord blood were obtained. At approximately three-month intervals during the following year, or until tests revealed no detectable titer of persisting antibody, blood samples were collected again from infants. Comparison of maternal poliovirus antibody titer at delivery with cord blood antibody titer (table 3) showed agreement within the error of the assay method (expected error equivalent to one serial dilution) in more than 85% of instances. In no instance did the cord antibody titer significantly exceed that of the maternal blood taken at delivery. Cord antibody titers less than maternal titers at delivery by two or more serum dilutions were observed for any type of poliovirus in no more than 14% of instances (table 3).

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quired antibody titer for each infant for each poliovirus immunotype. Within the error of such determination, rates of decline did not differ consistently with respect to type of passively transferred poliovirus antibody. The rate of decline also did not appear to be influenced by the initial titer level. Accordingly, rates of decline for all infants were averaged to determine the half-life of the passively transferred antibody (see figure). The indicated half-life of the poliovirus antibody was nearly 37 days. At 9 to 12 months of age, the majority of infants with cord blood titers of 1,024 or greater still exhibited detectable titers of antibody. The figure also illustrates the typical gradual decline in antibody titer found for two of the tested infants in the first year of life.

Response of Unexposed Infants to Poliomyelitis Vaccine.—Seventy-seven infants born of mothers included in this study were given two subcutaneous injections of 1 ml. each of commercially available Salk vaccine four weeks apart. The infants were injected initially either on reaching 1 year of age or on revealing a not-measurable low titer of passively transferred poliovirus antibody; usually, injections were begun from 3 to 12 months after delivery. Four weeks after a second injection, a blood specimen was obtained for determination of antibody response. Antibody response of vaccinated infants was calculated as the geometric increase in poliovirus antibody titer after vaccination, corrected for the exponential drop in titer of passively transferred antibody as determined by the half-life estimate. Of these infants who had no previous actively immunizing experience with poliovirus (respons
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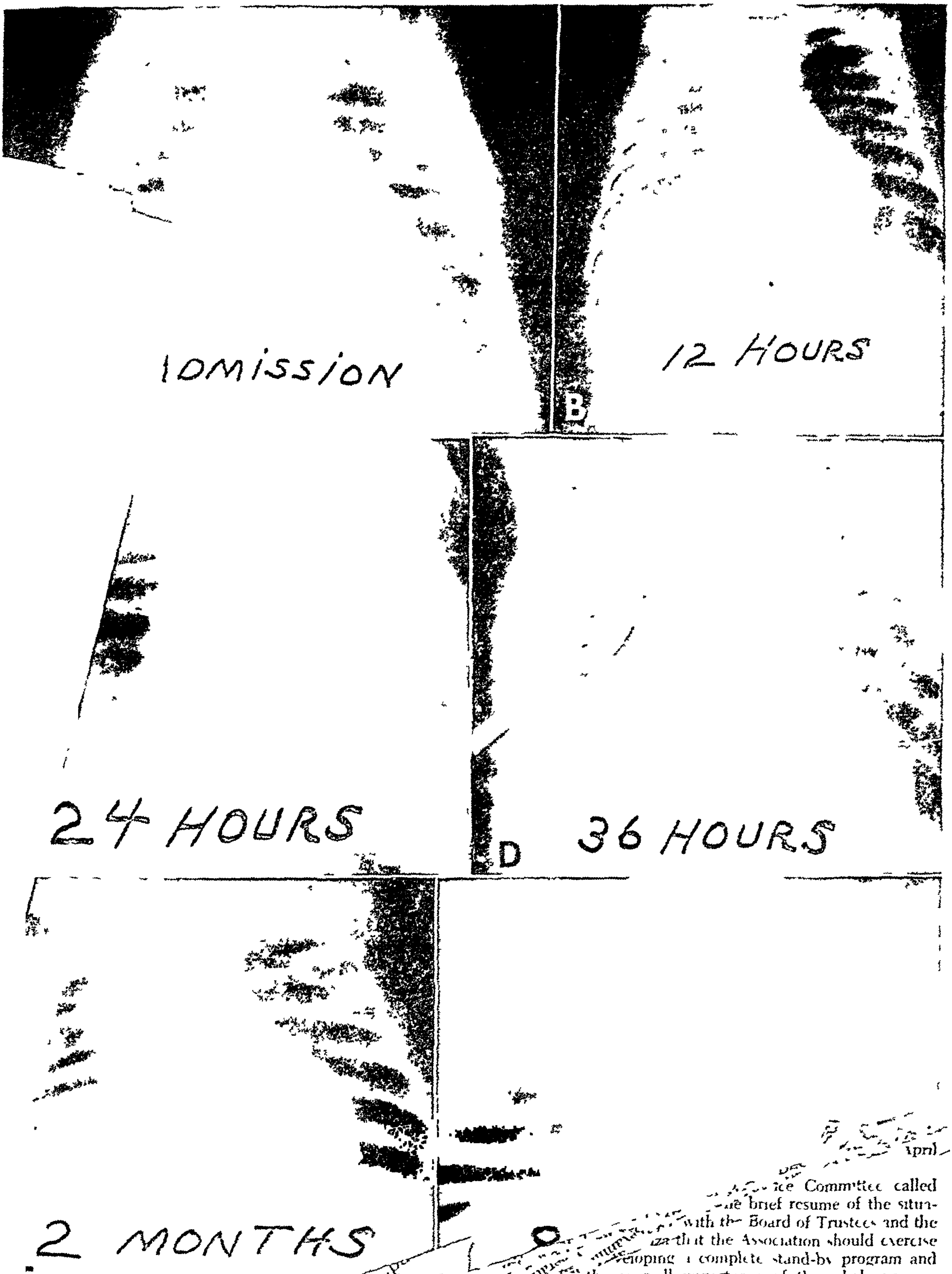
TABLE 2.—*Response of 136 Pregnant Women to Two Injections of Poliomyelitis Vaccine, Measured as Geometrically Averaged Ratios of Poliovirus Antibody Titers, and Proportion of Pregnant Women with Titers Not Measurable Before and After Two Injections*

	Response to Vaccination, Type*											
	Subcutaneous						Intradermal					
	Averaged Ratio			Not Measurable, Frequency			Averaged Ratio			Not Measurable, Frequency		
Vaccine Lot	1	2	3	1	2	3	1	2	3	1	2	3
025549—A	11.2 (24)	9.1 (25)	9.8 (25)	1/24	0/25	0/25	9.1 (25)	13.5 (25)	12.2 (22)	0/25	0/24	3/25
029126—A	10.7 (20)	20.9 (20)	14.8 (20)	0/20	0/20	0/20	17.4 (16)	18.6 (19)	19.1 (17)	3/19	0/10	2/19
9184-633862	8.3 (19)	8.4 (23)	10.4 (19)	4/23	0/23	4/23	12.0 (15)	17.0 (21)	24.0 (17)	7/22	1/22	5/22

* Number of averaged observations is recorded in parentheses.



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STAPHYLOCOCCIC PNEUMONIA IN INFANCY AND CHILDHOOD

ANALYSIS OF SEVENTY-FIVE CASES

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and
Robert J. Haggerty, M.D., Boston

Primary staphylococcic pneumonia is an important entity which requires the attention of both physician and surgeon, for a child with this illness often needs the services of both. As with any pneumonia in infancy, the presenting signs and symptoms may suggest an acute abdominal condition. The following are the criteria for diagnosis of staphylococcic pneumonia: (1) a positive culture for hemolytic Staphylococcus pyogenes var. aureus from empyema fluid, or from lung parenchyma at autopsy, together with compatible clinical and radiologic findings, or (2) the roentgenographic finding of cystic, radiolucent areas in the lungs of an infant with active pneumonia. Treatment of these patients includes vigorous supportive care, blood transfusions, prolonged treatment with specific antibiotics, and, frequently, closed-tube thoracotomy drainage.

In recent years a change has occurred in the spectrum of pulmonary infections requiring hospitalization.[1] During the winter and spring months pediatric wards are no longer filled with numerous patients with pneumococcic and streptococcic pneumonia; most of the time such patients are being treated satisfactorily with antibiotics in the home. There does seem to be, however, an increasing incidence of primary staphylococcic pneumonia.[2] To characterize this disease as it has been seen in recent years, a detailed analysis has been made of 75 consecutive patients treated at the Children's Medical Center during a period of approximately six and one-half years (1951 through July, 1957.)
presentation of these data will emphasize that
is an important entity which requires the atten-
n of both physician and surgeon, for a patient
ith staphylococcic pneumonia often needs the
services of both.

Criteria for Inclusion of Cases

are concerned in this paper only with
pneumonia produced by the hemolytic
lococcus pyogenes var. aureus. This series
not include any of the numerous patients with
ronic debilitating diseases, such as pancreatic
fibrosis or agammaglobulinemia in which pneumonia is merely a complicating event and from which the lung frequently yields at autopsy a positive culture for Staph. pyogenes *var. aureus.*

The following criteria for diagnosis of staphylococcic pneumonia have been used: (1) a positive culture for hemolytic Staph. pyogenes var. aureus (hereafter designated as "positive culture") from empyema fluid, or from lung parenchyma at autopsy, together with a compatible clinical and radiologic picture; or (2) the roentgenographic finding of cystic, radiolucent areas in the lungs of an infant with active pneumonia. A positive nose
throat culture for Staphylococcus in the pres-
al signs of pneumonia is not a valid
diagnosis of staphylococcic
proportion of pa-
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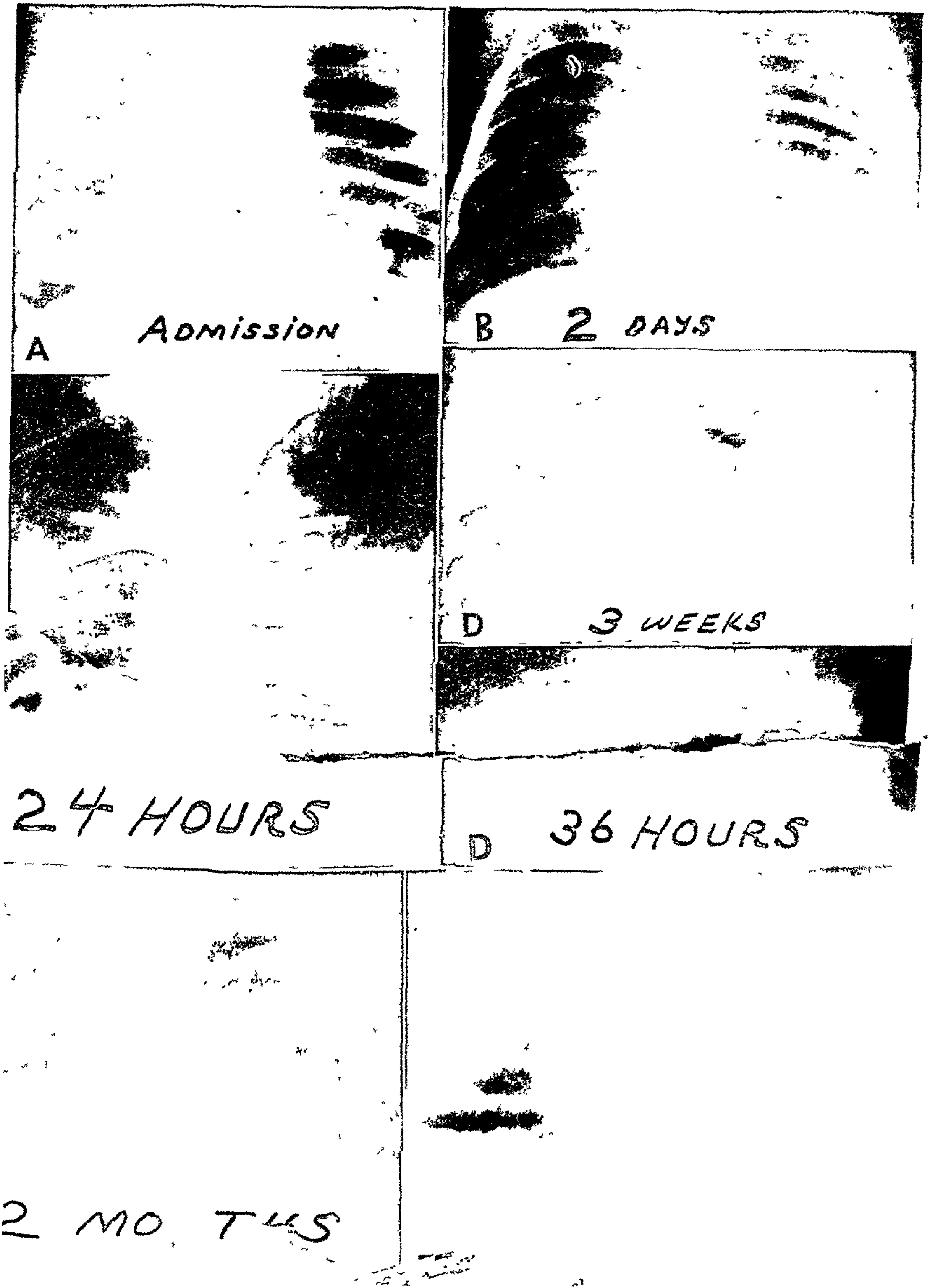
Radiologic Findings

There are several distinctive x-ray findings
staphylococcic pneumonia in infancy that are fo
cteriologically proved cases and rarely fo
associated with pneumonias of other etiology.[4]
recognition of these characteristic roentgenograp
changes permits the presumptive diagnosis
staphylococcic pneumonia even when one can
obtain cultural proof, either because there is
pleural fluid or because the patient has recei
antibiotics previously.

Distribution.—There may be a focal, segme
or lobar distribution of the infiltration on roent
ographic examination of the chest. This corre
with studies of Reimann[5] suggesting bro
genous entrance of bacteria with extension
periphery by way of lymphatics and inte
tissues. One may note various stages in a lu
single examination.

Initially, x-ray examination of the chest of
an extremely ill child may reveal very little
a faint focal mottling of the lung parench
may progress rapidly to patchy
heral distribution, unlike
spiratio



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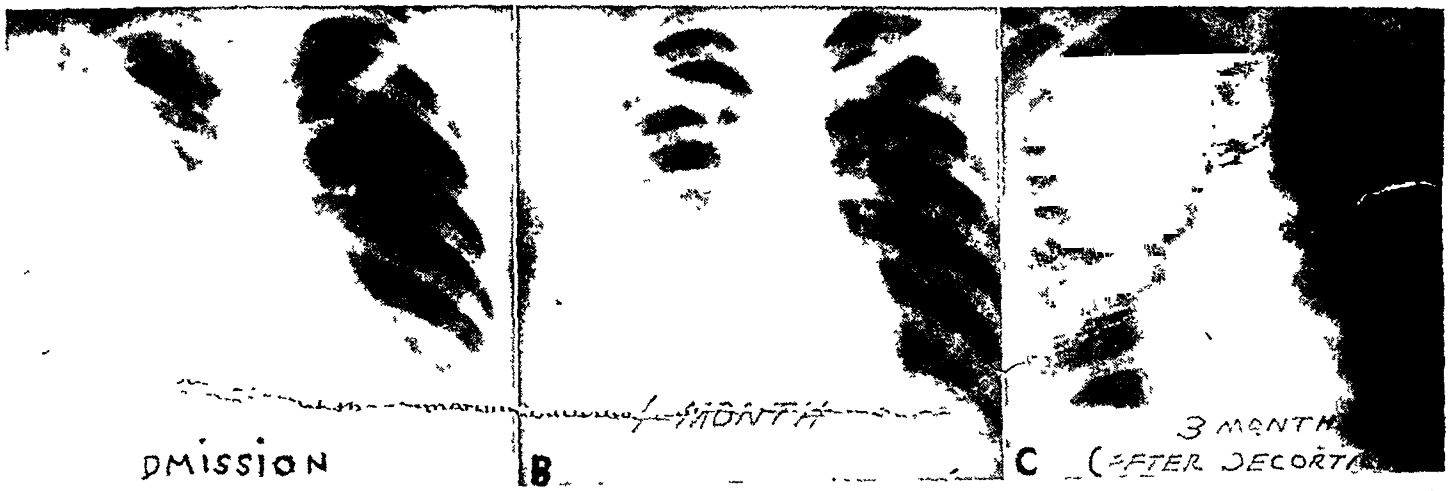
a later stage, coincident with bronchial and alveolar necrosis, characteristic of this suppurative pneumonia, multiple cyst-like emphysematous blebs appear. These result when air enters the interstitial spaces by way of necrotic areas in the small bronchi, becomes trapped, and gives a picture suitably described by Neuhauser and Wittenborg[6] as "lobular ectasia" (fig. 1). This roentgenographic finding was present in 65 patients (87%) in this series. Those patients in whom this finding was not present were principally older children who presented as having neglected empyema (fig. 2). This correlates clinically with the superior ability of the older patient to localize the infection,[1] as opposed to infants, in whom a spreading infection with bronchiolar necrosis seems to be an almost constant feature of staphylococcic pneumonia.

Pneumatocele Formation.—Certain of these small cyst-like accumulations of air may then expand with alarming rapidity, compressing adjacent lung tissue and frequently rupturing into the pleural

right; in 22 (29.3%) it was on the left; and in 10 (13.3%) it was bilateral. We have not encountered bilateral pleural complications, such as pneumothorax, requiring tube drainage of both pleural spaces, but certainly this can occur.[7]

It is important to emphasize the great rapidity with which the x-ray findings may progress, from minimal infiltration to empyema and tension pneumothorax in a few hours. This is graphically illustrated by a patient (fig. 1) in whom the initial film showed only minimal ill-defined localized increase in density in the right lower lung field, which progressed in 12 hours to a large pleural effusion and in 24 hours to a tension pneumothorax, requiring decompression as a lifesaving measure.

It is also worthy of emphasis that there may b a complete dissociation of the clinical state of th patient and his x-ray findings. Not only may a ver ill child present few roentgenographic signs initially, but later, during convalescence, a child wh appears clinically well and afebrile may develo



2.—Roentgenograms of 13-year-old girl. *A*, unresolved empyema after initial treatment elsewhere. *B*, appearance afte nth of catheter drainage and use of enzymatic débridement. *C*, essentially normal appearance after decortication.

ce, causing a tension pneumothorax, which usually requires immediate decompression. Thirty-four patients (45%) in this series did develop such pneumatoceles (fig. 3). There were 14 patients (19%) with simple pneumothorax, but, more important, there were 17 patients (23%) with tension pneumothorax. There were four patients (5%) with fibrothorax.

Empyema.—Empyema is the second most frequent finding, occurring in 53 of these patients (71%) (fig. 2 and 4). Indeed, it is rare for empyema [illegible] to be due to any agent other than [illegible] var. aureus. The combination of [illegible]thorax (pyopneumothorax) [illegible] infection.

[illegible] that most [illegible]

tremendous pneumatoceles and a degree of pulmonary compression with which one would expec great distress to the patient. This is well demonstrated in the patient shown in figure 3, in whom pneumatocele formation after hospital discharge prompted readmission of the child in spite of his clinical well-being, for fear that sudden difficulty might arise at home, 100 miles distant.

Duration of X-ray Findings.—It often takes several weeks for the pulmonary roentgenographic signs to subside completely; this has prompted the continuation of therapy with antibiotics for three to six weeks after discharge. Pleural thickening may be evident by x-ray for four to six months. In no case has permanent change been apparent in either lung or pleura on long-term follow-up films.

Clinical Features

[illegible]idence.—Figures 5 and 6 depict the ye [illegible] incidence in the 75 patients [illegible]mber of patients seen

tures. Blood cultures yielded hemolytic Staph. pyogenes var. aureus in five additional patients, in whom pleural fluid cultures were not performed. We have not resorted to the lung puncture technique as reported by Disney[9] for establishing a diagnosis of staphylococcic pneumonia.

With bacteriological proof of hemolytic Staph. pyogenes var. aureus in only 40 (53%) of the 75 patients in this series, one might well raise the criticism that pulmonary disease in the remaining patients was not due to this agent. As mentioned above, however, and previously by Campbell,[4] it is possible to rely on typical roentgenographic findings to make this diagnosis when cultures fail to grow because of previous administration of antibiotics, or when no pleural fluid is available for culture.

Antibiotic Sensitivities.—Complete antibiotic sensitivity tests were not performed in a number of the earlier cases in this series. Disk sensitivity tests were done, however, in 46 patients (61%), and in 40 of these the organisms were resistant to penicillin. None were reported as resistant to chloramphenicol or erythromycin.

White Blood Cell Count.—These patients characteristically present with an elevated white blood cell count. The average value for this series was 31,000 white blood cells per cubic millimeter. The highest value of 104,000 occurred in a 2-month-old infant with a tension pyopneumothorax. The lowest count, 600 white blood cells per cubic millimeter, was observed in a moribund premature baby who died on the second hospital day.

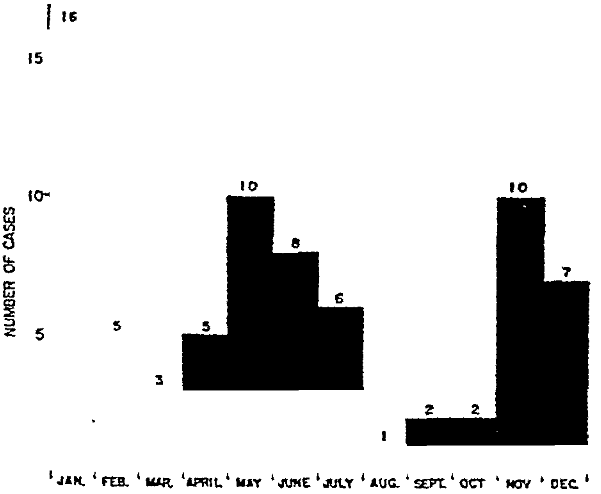


Fig. 6.—Seasonal incidence of staphylococcic pneumonia, 1951-1957 (75 cases).

Treatment.—These are usually critically ill infants. Many require, in addition to appropriate antibiotics, such vigorous general supportive care as blood transfusions, oxygen, humidified at[illegible]phere, and, often, surgical draina[illegible] are frequently anemic [illegible] become [illegible]ical Association. hemoglobin values of 7 to 8 Gm. %, secondary to overwhelming sepsis and loss of blood constituents in formation of empyema fluid. They often benefit from multiple transfusions to keep their hemoglobin values in the range of 12 to 13 Gm. %, at which level they seem to recover better from their illness.

Therapy with antibiotics must be specific and in adequate dosage. One cannot rely on penicillin alone, because the vast majority of these organisms are resistant to penicillin. Most of these infants are now treated at this institution with a combination of chloramphenicol and erythromycin as soon as the clinical, radiologic, or bacteriological picture suggests the diagnosis of staphylococcic pneumonia. The concomitant use of these two drugs may be more effective than either alone, for there is experimental evidence that the emergence of resistant organisms is less likely to occur when they are used together.[10] We usually administer the drugs by the intravenous or intramuscular route initially, switching to the oral route only after a satisfactory clinical response. Usual drug dosages are in the ra[illegible] of 100 mg. per kilogram per day for ch[illegible] April col and 50 mg. per kilogram pe[illegible] mycin to a maximum of [illegible]ce Committee called is current practi[illegible]e brief résumé of the situa- [illegible] with the Board of Trustees and the to four [illegible]za that the Association should exercise [illegible]eloping a complete stand-by program and [illegible] the over-all importance of the whole vaccine distribution problem. It urged the completion of the forthcoming [illegible]pplementary report on mass immunization at the earliest date possible, and recommended that no action be taken at this time

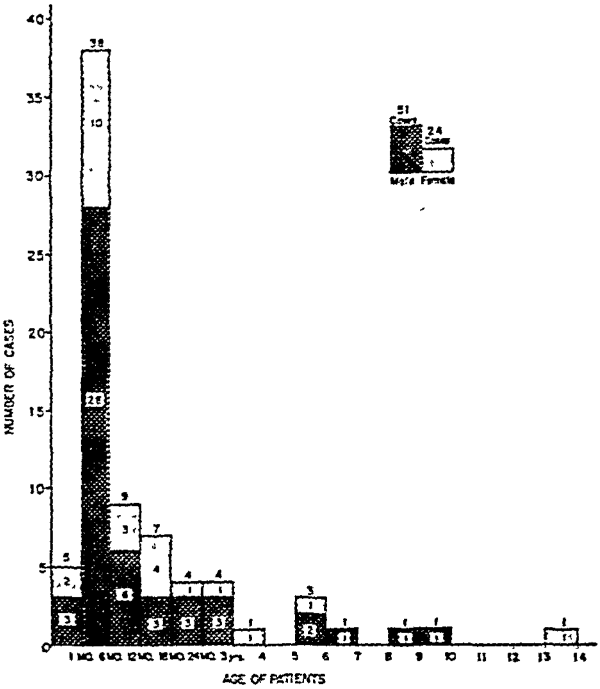


Fig. 7.—Age and sex distribution of staphlococcic pneumonia, 1951-1957 (75 cases).

other drugs as well. Eighteen patients (24%) were treated with other antibiotics, principally during the early part of the series. Figure 8 illustrates the chest of a patient treated solely by medical means.

Closed-tube thoracotomy was necessary in 30 patients (40%). Enzymatic débridement was employed in 12 patients (16%). Decortication was uired in four patients (5%); none of these pa-nts had been treated initially at this institution, t they were referred at a later stage with unsolved empyema and resultant pleural thickening, ith encasement of the lung. The conditions of all atients ultimately cleared completely, with no scoliosis resulting.

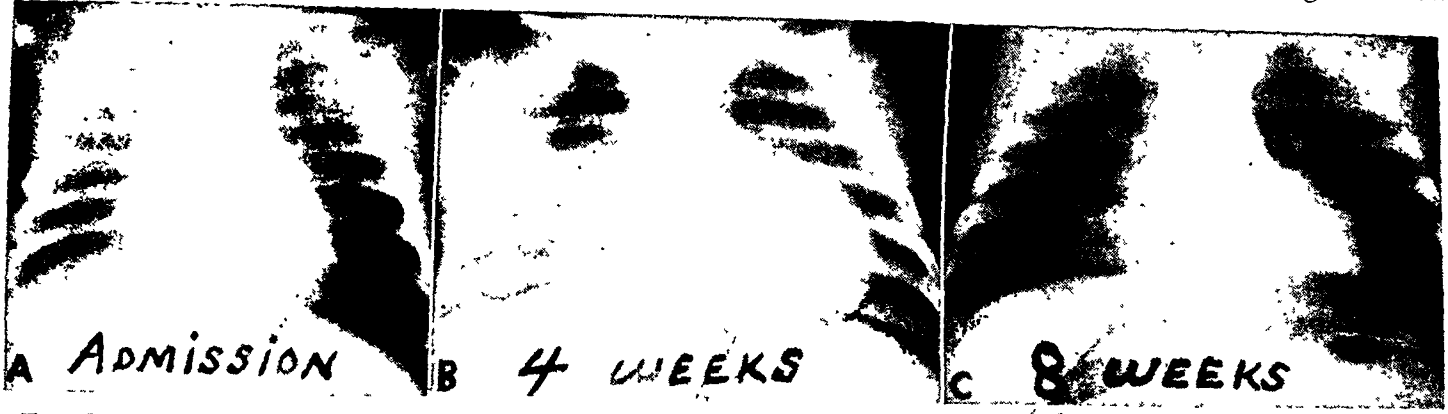


Fig. 8.—Roentgenograms of patient treated with chloramphenicol and erythromcyin. *A*, infiltration, multiple blebs, and pleural fluid. *B*, one pneumatocele. *C*, essentially normal appearance.

Deaths

'ere nine deaths (12%) in this series, four ıre babies and all but one in infants onths of age. The table summarizes

Surgical Considerations

Several distinctive features of staphylococcic pneumonia are of surgical significance. Foremost is the extreme rapidity with which events may progress. We have seen a moderately ill child with minimal indications of pneumonia change in a few hours to an exceedingly distressed baby, at death's door, with a tension pyopneumothorax. This is illustrated well by the roentgenograms in figure 1, of a 5-month-old male with a distended abdomen referred for consideration of an intra-abdominal process. Examination revealed minimal signs of pneumonia. He developed tension pyopneumothorax within 24 hours, necessitating insertion of a chest tube as a lifesaving measure.

The use of closed-chest drainage in selected cases performs a dual role. First, by evacuation of air and pus from the pleural space, there is often an immediate improvement in ventilation, a point of considerable importance when parenchymal in- ~ent is sufficiently extensive to reduce the ~acity to a low level. One frequently ~on in the over-all toxic state exudate, as shown erature fell

Staphylococcic Pneumonia: Nine Deaths from Series of Seventy-five Cases

	Date	Remarks	Pertinent Autopsy Findings
o.	Jan., 1953	4 lb. (1,814.4 Gm. premature; treated in hospital for 22 days with penicillin, streptomycin, sulfadiazine, and oxytetracycline (Terramycin); gradual downhill course	Bilateral multiple lung abscesses
2 mo.	July, 1953	Respiratory distress for four wk.; referred as diaphragmatic hernia; massive empyema; treatment started with penicillin and streptomycin; died on first hospital day, before scheduled drainage could be performed	Pneumonia with abscess formation; empyema; skin furuncles; osteomyelitis of skull
3 mo.	Dec., 1953	Premature with cough for 2 wk.; treated with penicillin and streptomycin, and later chloramphenicol (Chloromycetin) and erythromycin; gradual decline.	Bilateral pneumonia; left pneumothorax; *hypoplastic kidneys*
2 wk.	May, 1954	Premature; a twin; respiratory distress since fourth day of life; admitted with referral diagnosis of tracheoesophageal fistula; pyopneumothorax; tube inserted; died on sixth hospital day; penicillin, streptomycin, chloramphenicol, and erythromycin used	Bilateral pneumonia; left empyema
2 wk.	Nov., 1954	Three days of anorexia, respiratory distress, and vomiting; massive left empyema (fig. 4); therapy with penicillin, streptomycin, chloromycetin, and erythromycin started; died on first day in hospital, without drainage	Massive empyema; bilateral pneumonia
19 mo.	April, 1955	Treated for two months elsewhere for pneumonia, slo [illegible]; died two days after admission; on therapy with chloramphenic	Marked lobar consolidation, with areas of empyema
1 wk.	June, 1956	Premature admitted in extremis; developed tension [illegible] eved with a tube; therapy with penicillin, sulfadiazine, chloramphenicol, erythromycin; improved, but then aspirated a gavage feeding.	Bilateral pneumonia: aspiration of feeding
	1956	Admitted in poor condition with pyloric stenosis; continued to vomit postoperatively; developed *Staphylococcus* infection at site of scalp vein infusion, then pneumonia with tension pneumothorax; tube inserted; died in six hours; dequate antibiotic dosage	Bilateral pneumonia; pyloric canal adequate
		in acute distress with pyopneumothorax; immediate tube; chlor- d erythromycin; dramatic initial improvement but sudden de- d day	Bilateral lung abscesses (fig. 9); pus in pericardium

from 105 F (40.6 C) to 99 F (37.2 C) in 12 hours after removal of 150 cc. of empyema fluid. Second, by producing prompt reexpansion of the lung, one averts the distressing complication of fibrothorax, which eventually requires decortication, a formidable and not always a satisfactory surgical undertaking.

Indications for Tube Drainage.—One cannot define dogmatically the precise indications for use of a thoracotomy tube, except to state that it is a conservative measure which should be used perhaps more often than it is. Certainly, tubes have been used in a higher proportion of the patients, in the latter part of this series of 75, with gratifying results, and no complications have resulted from insertion of these tubes in the 30 patients (40%) treated in this manner. Of the nine patients who died, four had had tubes inserted. One died of aspiration of a gavage feeding. In another, the tube was inserted at a time when the child was already moribund with overwhelming generalized sepsis. Two others died with massive bilateral pulmonary involvement in spite of adequate evacuation of their empyema and pneumothorax, which was unilateral in each patient. It is highly significant that only four deaths occurred in those patients with complications requiring tube drainage, for that group of patients were, generally speaking, the most severely ill of the series.

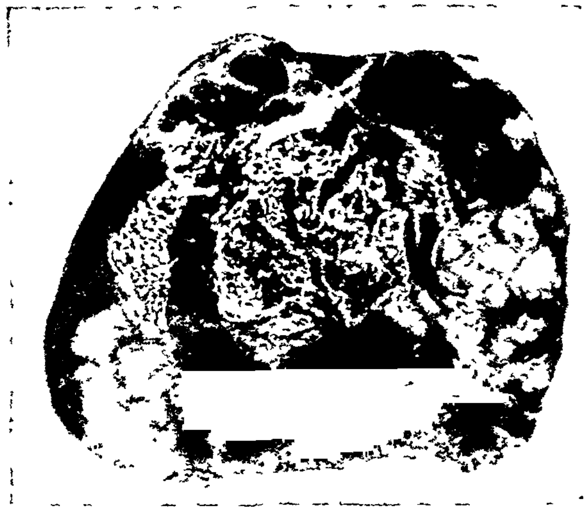


Fig 9.—Portion of left lung of infant who died from acute staphlococcic pneumonia. Note multiple abscesses.

amount of fluid, and the patient is improving rapidly, one may be justified in watching him for a few days, but not if there is any appreciable collapse of the ipsilateral lung. It is imperative to obtain frequent roentgenographic examination of the chest, especially in the initial days of this disease. Needle thoracentesis was performed on 30 patients in this series, principally as a single tap for bacteriological study of empyema fluid.

We have tended to avoid repetition of needle insertion for several reasons: First, insertion of a chest tube is very little more of a procedure and is infinitely more effective. We have repeatedly observed that chest taps with needles of apparently adequate caliber yield only a few cubic centimeters of pus, whereas a chest tube used immediately thereafter evacuates over 100 cc. of material. Second, there is a real danger of lacerating underlying lung parenchyma with a needle's sharp beveled edge as the lung expands.

A tube should be inserted immediately in any case in which a tension pneumothorax develops, and it is probably the safest course to take when any pneumothorax appears spontaneously early in the course of this disease, for a small pneumothorax can build up fatal tension in a very short time. If faced with such an emergency, without equipment ready for immediate insertion of a tube, one can always release a tension pneumothorax by insertion of an ordinary hollow-bore needle through an interspace. A further refinement consists of attaching a piece of rubber tubing to the needle, placing the distal end of the tubing just beneath the surface of some water in a container, a so-called water-seal, which permits egress of air under tension but prevents ingress of air on inspiration by the patient. It is sometimes impossible to differentiate between a loculated tension pneumothorax and a very large, thin-walled pneumatocele later in the course of this disease, and we have observed no ill-effects from insertion of a chest tube directly into such an air collection in several instances.

We prefer the use of 8 to 10 cc. of water of suction, combined with a water-seal bottle closest to the patient (fig. 10). It is important, and sometimes overlooked, that the chest tube never be clamped during the early phase of this illness, such as when the patient leaves his ward to have an x-ray examination performed, lest a tension pneumothorax should occur. Instead, the child side, depending on the operator's preference and the degree of the patient's respiratory distress. Some patients with tension pneumothorax seem to have better ventilation in the sitting position during those critical minutes before drainage is performed. The child must be restrained firmly, but gently, preferably by two nurse-assistants. Unless there is a loculated collection of air or fluid which indicates the most favorable location for the tube, one chooses a convenient point in approximately the anterior axillary line in the fourth or fifth interspace. This is often slightly higher than would seem ideal, by roentgenogram, but one must be careful not to position the tube too low, for on evacuation of pleural fluid the diaphragm may rise and render less effective the drainage from a tube placed too low.

After suitable cleansing of the skin, a very small cutaneous incision is made, with the patient under local anesthesia, to facilitate passage of the trocar. The trocar is pushed in obliquely with a twisting on, forcefully, but with restraint to avoid plunging deeply into the chest on traversing the parietal pleura. Flexing the child's chest toward the opposite side opens the rib interspace and facilitates passage of the trocar. After removal of the stylet from the trocar, the previously prepared tested tube is inserted, the trocar is withdrawn, is then pulled back into its best posi- can be determined easily be- around the tube with ion of the tube, point at

wo-bottle chest suction apparatus. Bottle on er-seal," closer to patient. Bubbles in it demon- ice of active bronchopleural fistula.

*The duration of such drainage is variable. It may be required for only a few days, or it may be necessary for three or four weeks. The average duration in this series was 13 days; the longest was for 33 days. The tube is kept on suction until there is no evidence of further leakage of air or of purulent drainage. It may then be put on water-*seal for a day or two, then clamped for a day or two, and if all is well by clinical and roentgenographic examination the tube may be removed. These tubes have been irrigated with small amounts of sodium chloride solution periodically to insure patency, but such irrigations should be done gently, in order not to flood the bronchial tree should a bronchopleural fistula be present.

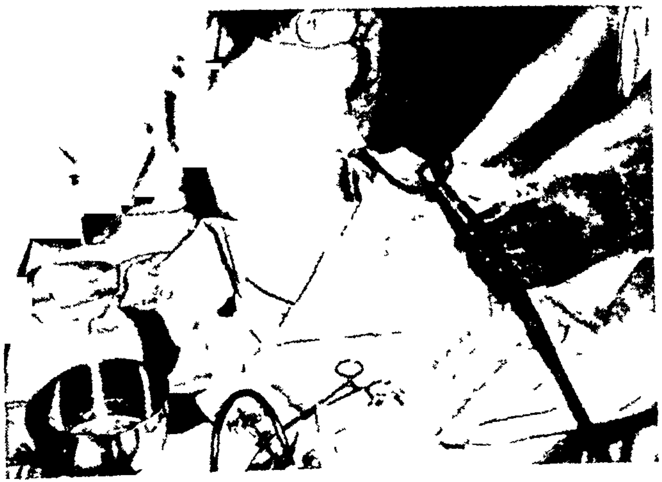


Fig. 11.—Child immediately after insertion of chest catheter, done in upright position because of extremely severe respiratory distress.

It is occasionally necessary to use more than a single tube, and one should not hesitate to reposition the or s oca

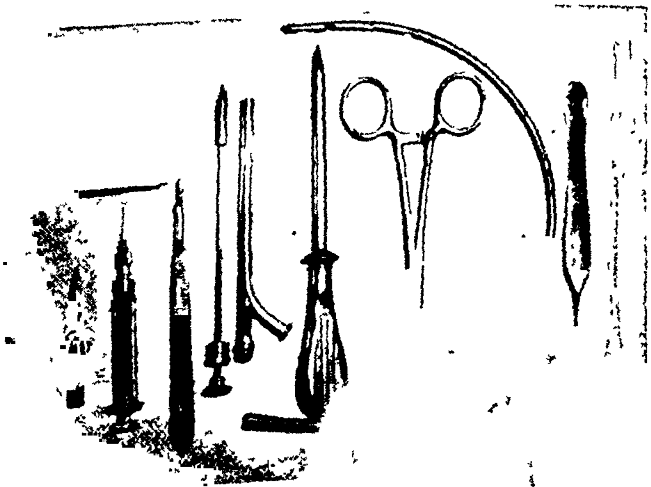


Fig. 12.—Relatively sim forming closed tube thorac

For infants, a 10 to 12 F. tube is adequate; a 14 to 16 F. tube is required for older children. Figure 12 illustrates the rather simple equipment one needs for this procedure.

In no case have we observed a bronchopleural fistula from staphylococcic pneumonia fail to close spontaneously on closed drainage. None of the patients required surgical closure. The longest duration of air leakage was 31 days.

Pneumatoceles.—Resolution of pneumatoceles may be a slow process, taking weeks or even months (fig. 8). As has been emphasized by Caffey,[11] surgical extirpation of these lesions is not necessary, because they disappear spontaneously. As previously mentioned, it is sometimes impossible to differentiate between a pneumatocele and a well-localized, loculated pneumothorax. Under such circumstances, with gradual enlargement of the cystic space and compression of adjacent lung, we have thrust a tube directly into the cyst, with no untoward effect, and with deflation of the cyst over a period of several days. We have not encountered a situation in which it was necessary to excise such a pneumatocele as described by Fisher and Swenson.[12]

tube clamped. If either of the above reactions occur, the enzymes should be drained immediately by unclamping the tube and irrigating with sodium chloride solution. These agents are often remarkably effective in liquefying thick pus and facilitating drainage. We have observed a moderate degree of intrapleural bleeding in two patients after the use of enzymes. However, both were children with abnormally low platelet counts.

Differential Diagnostic Considerations

As with any pneumonia in infancy, the presenting picture may seem occasionally to be an acute abdominal condition. An infant in respiratory distress may swallow a sufficient quantity of air to produce abdominal distention and further embarrass respiration. Under such circumstances, nasogastric Levin tube suction may be indicated.

A diaphragmatic hernia with intrathoracic loops of intestine may mimic clinically and by roentgenogram the picture of staphyloccic pneumonia, especially if there is compression atelectasis of the lung, with fever, secondary pneumonitis, and respiratory distress. Figure 13A shows such a case,

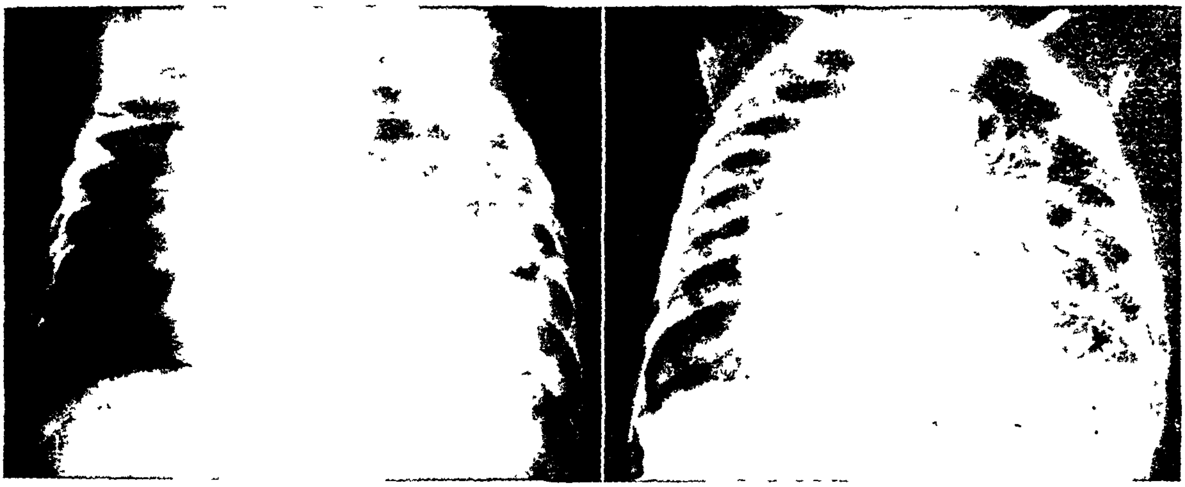


Fig. 13—Roentgenograms of baby with clinical picture of pneumonia and respiratory distress. Multiple "cystic lesions" simulate changes in staphylococcic pneumonia (*A*), which proved to be diaphragmatic hernia with loops of intestine in left pleural space, apparent after ingestion of barium sulfate (*B*).

Children's Medical Center. Bacteriological cultures of hemolytic Staphylococcus pyogenes var. aureus were obtained from empyema fluid or the lung in 40 patients (53%) in this series. Typical x-ray findings of staphylococcic pneumonia were present in all other patients. Distinctive roentgenographic features included the formation of usually multiple, small, pulmonary, radiolucent areas, pneumatocele formation, empyema, pneumothorax, and rapid change from one appearance to another.

Males outnumbered females by a 2:1 ratio. Although principally a disease of infants, occasionally cases occurred in older children. A significant number of patients had concomitant cutaneous staphylococcic infections. Many had previously received antibiotic treatment. Physical signs of pneumonia were not present initially in some patients.

We stress the need, in treatment of these patients, for vigorous supportive care, blood transfusions, prolonged treatment with specific antibiotics, and, frequently, closed-tube thoracotomy. Closed-tube thoractomy must be regarded as a conservative measure which is simple to perform and often lifesaving. Among the indications for insertion of a closed-thoracotomy tube are a significant collection of pleural fluid and tension pneumothorax. Attention should be paid to the proper technique of such drainage.

Enzymes have been employed in some patients whose illness is complicated by empyema. Differential diagnostic considerations which have been encountered include abdominal emergencies, dia-
matic hernia, and intrathoracic tumor. Nine
occurred in this series, and pertinent facts
to them have been listed. Staphylococcic
onia is an important entity with which physi-
and surgeon alike should be familiar, since a
proportion of patients require the services of
th.

300 Longwood Ave. (15) (Dr. Haggerty).

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References

1. Rogers, D. E.: Current Problem of Staphylococcal Infections, Ann. Int. Med. **45**:748-781 (Nov.) 1956.

2. Kanof, A.; Kramer, B.; and Carnes, M.: Staphylococcus Pneumonia: Clinical, Pathologic, and Bacteriologic Study, J. Pediat. **14**:712-724 (June) 1939. Ladd, W. E., and Swan, H.: Mortality in Acute Staphylococcal Empyema in Infants and Children: Study of 33 Surgically Treated Patients, ibid. **23**:297-302 (Sept.) 1943. Kanof, A.; Epstein, B. S.; Kramer, B.; and Mauss, I.: Staphylococcal Pneumonia and Empyema, Pediatrics **11**:385-392 (April) 1953. Bloomer, W. E.; Giammona, S.; Lindskog, G. E.; and Cooke, R. E.: Staphylococcal Pneumonia and Empyema in Infancy, J. Thoracic Surg. **30**:265-274 (Sept.) 1955. Wallman, I. S.; Godfrey, R. C.; and Watson, J. R. H.: Staphylococcal Pneumonia in Infancy, Brit. M. J. **2**:1423-1427 (Dec. 10) 1955. Gagne, F.: Staphylococcal Pneumonia in Infancy: Review of 40 Autopsied Cases, Canad. M. A. J. **73**:551-555 (Oct. 1) 1955.

3. McDermott, W.: Problem of Staphylococcal Infection, Brit. M. J. **2**:837-840 (Oct. 13) 1956.

4. Campbell, J. A.; Gastineau, D. C.; and Velias, F.: Roentgen Studies in Suppurative Pneumonia of Infants and Children, J. A. M. A. **154**:468-472 (Feb. 6) 1954.

5. Reimann, H. A.: Primary Staphylococcic Pneumonia, J. A. M. A. **101**:514-520 (Aug. 12) 1933.

6. Neuhauser, E. B. D., and Wittenborg, M. H.: Personal communication to the authors.

7. Richardson, W. R.: Personal communication to the authors.

8. Baldwin, J. N.; Rheins, M. S.; Sylvester, R. F., Jr.; and Shaffer, T. E.: Staphylococcal Infections in Newborn Infants, A. M. A. J. Dis. Child. **94**:107-116 (Aug.) 1957.

9. Disney, M. E.; Wolff, J.; and Wood, B. S. B.: Staphylococcal Pneumonia in Infants, Lancet **1**:767-771 (May 26) 1956.

10. Wright, S. S., and others: Antibiotic Combinations and Resistance to Antibiotics: Development of Resistance During Repeated Subcultures of Staphylococci and Certain Streptococci on Media Containing Penicillin, Streptomycin, Erythromycin, Terramycin (Oxytetracycline) and Chloramphenicol Used Singly and in Pairs, J. Lab. & Clin. Med. **42**:877-895 (Dec.) 1953. Jones, W. F., Jr., and Finland, M.: Antibiotic Combinations: Antistreptococcal and Antistaphylococcal Activity of Normal Subjects After Ingestion of Erythromycin or Chloramphenicol or Both, New England J. Med. **257**:744-748 (Oct. 17) 1957.

11. Caffey, J.: On Natural Regression of Pulmonary Cysts During Early Infancy, Pediatrics **11**:48-63 (Jan.) 1953.

12. Fisher, J. H., and Swenson, O.: Surgical Complications of Staphylococcic Pneumonia, Pediatrics **20**:835-847 (Nov., pt. 1) 1957.

TRIPLE VACCINES.—A group of infants was inoculated during the neonatal period with aluminum phosphate adsorbed or aluminum hydroxide adsorbed diphtheria-tetanus toxoid and pertussis vaccine, combined. The infants were observed up to 1 year following completion of the series of three inoculations. Based on diphtheria antitoxin titrations, responses to the aluminum phosphate and alumi-
um hydroxide absorbed antigens were comparable. Based on pertussis agglutination
month and 1 year following vaccination, the aluminum phosphate was better
um hydroxide adsorbed preparation. Better combined protection
ertussis followed inoculation with the aluminum phosphate
es in local or systemic reactions following the two
ta confirm the desirability of a fourth dose
tion is begun during the neonatal
J. M. Chapman, M.D.,
1958.

FIVE-YEAR FOLLOW-UP STUDY OF MEN WHO RETURNED TO WORK AFTER A MYOCARDIAL INFARCTION

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and
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In a five-year follow-up of men who had a myocardial infarction, 431 returned to some form of gainful employment in an average time of three months after their first infarction. In general, the onset of economic rehabilitation paralleled the functional cardiac status, but many patients returned to work despite symptoms of coronary insufficiency or heart failure. This particularly applied to physicians. Within 5 years, 33% (143 patients) had died or had retired. The younger patients worked longer than the older ones. Sixty-seven per cent of the 143 patients had died. It is of coincident interest that seven men in their eighth decade returned to gainful employment.

Most physicians agree that a great many individuals who survive an acute myocardial infarction can and should make an economic recovery. It is well documented that over 50% of those who recover from a myocardial infarction return to work.[1] Some elect to retire in the absence of disabling symptoms. There are varied reasons for this decision: enticing disability insurance, inability to change work classification, forced retirement on account of age, state of the economy as influencing the number of unemployed, accessability of welfare funds, and the emotional reaction to the illness. In addition, there are occupational hazards which must be avoided by an individual who has had an infarction and which might preclude reemployment. This has been discussed in a previous report.[1b]

There is need for follow-up studies of men who, after their first myocardial infarction, became employable to a degree as to constitute economic rehabilitation. Conner and Holt[2] reported that, of 117 patients with their first attack of coronary thrombosis, 75% were in good health at the end of one year after this attack and 21% at the end of five years. By good health was meant a state of health which permitted the patient to live his accustomed life and to regard himself as essentially well. Not all were entirely free of symptoms, but these symptoms were not sufficient to cause the patient to modify his mode of life or to prevent his working. Levine and Phillips[3] found that 18 (32%) of 56 men with myocardial infarction who had returned to work for a shipbuilding company were still working at the end of a year. Chambers[4] found that over 50% of his patients who survived a myocardial infarction for a year, with or without a recurrence, were working either full or part time. Others have stated that of those who returned to full capacity or who had only partial disability after an infarction, 40% died within five years.[1e] Crain and Missal[5] reported from the Eastman Kodak Company that 65% of 151 reemployed individuals who had myocardial infarction continued to work for five or more years. Master, Jaffe, and Kissane[6] reported that 41% of 200 individuals (men and women) returned to full employment after coronary occlusion and maintained this employment for an average of seven years.

Nature of Study Group

The present report is a five-year follow-up study of men who returned to work after their first myocardial infarction. Since there were only a few recorded instances in employed women, they were excluded from this study. All the patients were seen in private practice. Only those with characteristic clinical and eletrocardiographic evidence and those whom the onset of the infarction could be determined with certainty were selected. None of the patients received any special long-term medical therapy or surgery designed to improve the coronary artery circulation.

Four hundred thirty-one men met the above criteria. This represents a total of 95% available for follow-up study. The period during which the myocardial infarction had its onset ranged from Jan. 1, 1940, to Jan. 1, 1953, and the patients were followed until Jan. 1, 1958. Previously a five-year [illegible] study was done on only 117 patients observed fr[illegible] through 1944.[7]

men are more likely to have been retired or will retire or be unable to work after an infarction. It is of coincident interest that seven men in their eighth decade returned to gainful employment. In the age group 60-69, there were 81 patients; 50-59, 187; 40-49, 120; 30-39, 35; and 20-29, 1.

Within five years 143 (33%) had ceased work due to death or retirement; 288 (67%) worked more than five years after the infarction.

TABLE 1.—*Relation of Age at Onset of Disease to Duration of Work After Infarction*

Age Group, Yr.	Worked Less Than 5 Yr., No.	Worked More Than 5 Yr., No.
20-29	0	1
30-39	9	26
40-49	34	86
50-59	59	128
60-69	37	44
70-79	4	3
Total	143	288

Table 1 shows the age of the patient at the time of the onset of the infarction and the work status at the end of five years. Obviously younger men will work longer than the older ones. It is noteworthy that three patients who had the onset of their infarction after the age of 70 years were still working at the end of five years.

Table 2 lists the duration of work after infarction of the 143 patients who retired or died within five years. The major cause for termination of work was death. In this category is included only those who died suddenly or after only a short illness. Sixty-seven per cent died within five years, whereas in this same interval only 33% retired after returning
vork. The yearly deaths were approximately the
for each of the five years. Of those who even-
retired, few did so within the first two years.
of those who retired subsequently died, but
are not included in the group who died within
years. The detailed causes for death are not
ed. In a previous report[7] it was found that car-
iovascular disease was responsible for 82% of the deaths which occurred within five years after the patients' returning to work after a myocardial infarction. The exact incidence of death from another myocardial infarction could not be determined, since many patients did not live long enough in their final illness to have electrocardiographic examinations and since an insufficient number of au-
nsies was performed. Sudden or relatively sudden
urred in 25% of the patients who died.
able to secure a control group for
did not work after the in-
to work, were already
age and thus
turned
who developed congestive failure, or the number of those who subsequently died was no greater in the working group than in those who did not return to work (even though the nonworkers included a large number of extremely ill patients). Reports from work classification units[9] are in accord in that continued regulated employment had no adverse effect on the course of patients with myocardial infarction, but controls are not mentioned. Billings and associates[1a] found that the mortality rate for patients with myocardial infarction (not all were studied from the first attack) who were able to return to some type of useful activity was higher than that of the normal population of Tennessee for the first two years after infarction only. After three years it paralleled that for the Tennessee population of the same age, sex, and racial distribution.

Comment

The patients in this study returned to some form of gainful employment in an average time of three months. There were no fixed criteria for the decision to return to work. Each patient had his own physical, psychological, and economic problems which required evaluation. Consultation with employers, personnel managers, and company physicians was valuable in establishing early rehabilitation. The type of disability insurance which the patient has may influence the decision as to when full-time work is resumed. The more liberal the policy, the longer will the individual be tempted to remain away from his job. Since sudden or relatively sudden death can occur in 25% of those who ultimately die, men engaged in work hazardous to their fellow employees or to the public—such as crane operators, bus drivers, and railroad engineers—were encouraged to seek other employment. Time was required to find another job.

TABLE 2.—*Duration of Work After Infarction of 143 Patients Who Retired or Died Within Five Years*

Work Period, Yr.	Retired, No.	Died, No.
0-1	2	23
1-2	7	21
2-3	12	15
3-4	11	17
4-5	15	20
Total	47	96

In general, the onset of economic rehabilitation paralleled the functional cardiac status, but many patients returned to work despite symptoms of coronary insufficiency or heart failure. This particularly applied to physicians. No attempt was made to analyze the duration of work as compared to the functional status of the heart on the patient's return to work. Obviously, the patient who has made a good functional recovery will live and work longer
ne who survives the initial impact but is dis-
gestive heart failure, angina pectoris,
sm. It has previously been

Data from Tests for Esophagitis in Thirty-three Patients with Abdominal Pain

Case, No	Age, Yr	Clinical Diagnosis*	X ray Diagnosis†	Esophagoscopic Findings‡			Esophagitis Tests§	
				Erythema	Granularity	Varices	Response	Criteria of Esophageal Origin
			Group with No Significant Gastro-intestinal X-ray Abnormalities					
Positive Tests								
1	25	Abdominal pain, c u ; peptic ulcer (history)	Prolapse of antral mucosa	L/4	L/4	...	+	B,D,E
2	32	Abdominal pain, c u ; peptic ulcer (history)	Normal	L/4	L/4	...	+	B,D,E
3	25	Abdominal pain, c u ; duodenal ulcer (history)	Normal	L/2	L/3	L/2	+	B,D,E
4	28	Abdominal pain, c u	Normal	L/2	L/2	L/2	+	B,D,E
5	32	Abdominal pain, c u	Normal	L 2/3	L 2/3	L 2/3	+	B,D,E
6	33	Abdominal pain, c u ; peptic ulcer (history)	Normal	L/2	..	L/2	+	B,C,D,E
7	31	Abdominal pain, c u	Normal	...	.	M/3	+	B,D
8	33	Pneumonia, abdominal pain, c u	Normal	...	L/4	..	+	B,D,E
9	40	Chronic bronchitis; abdominal pain, c u	Normal	...	..	3/3	+	B,D,E
10	38	Abdominal pain, c u	Normal	Not examined	..	...	+	B,D,E
Negative Tests								
11	61	Abdominal pain, c u	Normal	...	...	L 2/3	—	...
12	42	Abdominal pain, c u	Normal	...	...	L/2	—	...
13	42	Peptic ulcer (history) Abdominal pain, c.u	Normal	Normal	...	..	—	...
14	59	Abdominal pain, c u	Normal	...	...	L/3	—	...
15	34	Cirrhosis; abdominal pain, c u ; superficial gastritis (on gastroscopy)	Prolapse of antral mucosa	...	...	L/2	—	...
16	41	Abdominal pain, c u	Normal	L/4	L/3	L/3	—	...
17	61	Emphysema; arthritis; chest and abdominal pain, c u	Duodenal diverticulum	Not examined	...	...	—	...
Positive Unrelated Tests								
18	49	Abdominal pain, c u	Normal	Normal	...	...	+ unrel.	A,B
19	45	Abdominal pain, c u ; gastrointestinal bleeding, c u	Prolapse of antral mucosa	Not examined	...	...	+ unrel.	A,C
20	35	Abdominal pain, c u ; coronary artery disease	Prolapse of antral mucosa	Not examined	...	...	+ unrel	A,B,D
		Group w	tro-intestinal X-ray Abnormalities					
Positive Tests								
21	39	Duodenal ulcer	eformity	3/3	...	3/3	+	B,D,E
22	68	Abdominal pain, c u ; possible	al mucosa; Faint gallbladder (3	..	L/3	...	+	B,C,D,E
23	70	Pneumonia; duodenal ulc	odenal	Normal	...	...	+	B,D,E
24	45	Cholelithiasis; cholec		Not examined	...	...	+	B,C,D,E
Negative Tests								
25	49	Duodenal ulcer		3/3	...	...	—	...
26	26	Duodenal ulcer		L/3	L/3	...	—	..
27	47	Coronary art prepyloric	iatus cer	..	L/4	...	—	...
28	60	Duodenal pancrea disease	is	Normal	...	...	—	...
29	38	Duode	rmity, hiatus	...	...	L/2	—	...
30	29	Duo	eformity	Not examined	...	...	—	...
31	51	D	al and antral deformities	Not examined	..	...	—	...
32	49		odenal deformity; gastric diverticulum	Not examined	...	...	—	...
Positive Un								
33			Duodenal ulcer niche	Not examined	..	.	+ unrel	A,B,D

and one was not examined (case 10). The endoscopic abnormalities in eight of the nine examined confirmed the results of the acid perfusion test. The above results demonstrate that symptoms limited to an upper abdominal distribution can be of esophageal origin and that, in fact, they commonly are. Indeed, esophagitis, as frequently as

tients cate-
cause undeter-
patients with a
vas endoscopic
1-8); normal
(case 9);

---

* Cl diag diag esophagitis test or esophagoscopy Abdominal pain, c u. (cause undetermined), was pre

x ray abnormalities If duodenal deformity were present and the history were not incomp

abnormal findings of upper gastrointestinal series and esophageal fluoroscopy done

m in 26 Reported abnormalities indicate remainder of examinations were normal

L/4, lower fourth; L 2/3, lower two thirds; M/3, middle third, etc. Varices

positive; —, negative, + unrel , positive unrelated See text for definition of responses

uer us-chol April ice Committee called

tients with gastrointestinal x-ray abnormalities. Results of the tests were related to esophagoscopic examinations performed in most cases.

Methods

Esophagoscopy.—Esophagoscopy was performed with the Eder-Hufford esophagoscope. Notations were made as to the location and severity of granularity, erythema, and varices. In these cases, there were no instances of severe, ulcerating esophagitis. The endoscopic diagnoses were agreed on by at least two observers who were unaware of the acid perfusion test response in most instances.

Test for Esophagitis.—The test for esophagitis was performed as previously described.[1b] In all cases but one, two plastic tubes were used, one in the esophagus (30-35 cm. from the nares) and the other in the stomach. Acid or saline solutions were delivered from intravenous fluid bottles hung behind the patient through either tube, changes being made without the patient's knowledge. After administration of the control saline solution (6-7.5 ml. per minute for 10-15 minutes), the 0.1 *N* hydrochloric acid solution was administered for a minimum of 30 minutes at 6-7.5 ml. per minute or until severe or typical discomfort was produced. In many instances, the duration and/or rate of acid perfusion were increased. The criteria previously described [1b] which were used to differentiate esophageal from gastroduodenal origins of induced symptoms are as follows:

A. Distribution of Symptoms: Midline symptoms extending above the level of the xiphoid cannot be considered to be of gastric, duodenal, or small
l origin[5] and are therefore presumably of
origin. However, since upper abdominal
be of gastric, duodenal, small intestinal,
geal origin, this criterion does not localize
in patients with solely abdominal dis-
of symptoms.

y of Disappearance of Symptoms After
tion of Esophageal Acid Administration: Ces-
on of acid delivery for a few minutes allows the acid stimulus to be removed quickly from the esophagus, while the intragastric pH is not altered significantly. If the symptoms are in fact produced by alteration of pH, disappearance of symptoms within a few minutes after cessation of acid perfusion indicates that the symptoms must have originated in
ophagus rather than the stomach.

of Disappearance of Symptoms After
tion: A small dose of adminis-
ges in esophageal and
cessation of acid
earance of
ates

petitive circumstances, the small increments of acid and antacid can alter the pH of the esophageal but not of the entire gastric contents to extremes of pH.

E. Introduction of Acid into Stomach for Comparative Effects: The esophageal origin of solely abdominal symptoms is indicated by reproduction of symptoms with esophageal perfusion but not with gastric delivery of acid. Thus, esophageal acid administration initially (and repetitively) causes symptoms which are relieved by stopping acid flow; the acid then delivered directly into the stomach causes no symptoms; then readministration of acid into the esophagus repetitively causes the abdominal symptoms. The failure of acid delivered directly into the stomach to produce symptoms, whereas, both immediately before and after, acid delivered into the esophagus elicited symptoms, must be considered as the most crucial evidence of their esophageal origin.

Classification of Results

Results of the test were characterized as (1) positive: reproduction of the clinical abdominal symptoms originating in the esophagus, (2) negative: failure of test to elicit symptoms, and (3) positive-unrelated: production of chest symptoms from an esophageal source which were unrelated to the abdominal complaints being investigated. Thus, for this report, the abdominal symptoms not being reproduced by the test, positive-unrelated response represents a negative response to the test in regard to the investigated complaints.

The acid perfusion test for esophagitis was performed on 33 patients, of whom 24 were examined esophagoscopically. Of the 20 patients with the diagnosis of abdominal pain, cause undetermined (having normal gastrointestinal x-ray examinations), the test was positive in 10 (cases 1-10), negative in 7 (cases 11-17), and positive-unrelated in 3 (cases 18-20). Of the 13 patients with definite gastrointestinal x-ray abnormalities, the test was positive in four (cases 21-24), negative in eight (cases 25-32), and positive-unrelated in one (case 33).

The table summarizes the ages; clinical, x-ray, and esophagoscopic diagnoses; and results of the tests performed. Figure 1 presents the distribution of symptoms in the patients with negative x-ray findings but with abdominal pain of esophageal origin (cases 1-10). Figure 2 indicates the abdominal symptoms of esophageal origin in patients with abnormal x-ray findings of the gastrointestinal tract lesions which were asymptomatic and unrelated to the patient's present symptoms (cases 21-24).

Results of Tests for Esophagitis

nts with Abdominal Pain, Cause Undeter-
were 20 patients with a diagnosis
undetermined. These pa-
al x-ray abnormali-

COUNCIL ON DRUGS

SYMPOSIUM-PANEL DISCUSSION ON THE USE AND ABUSE OF ADRENAL STEROIDS

An A. M. A. symposium and panel discussion on the captioned subject, sponsored by the Council, will be presented at the Lisner Auditorium of the George Washington University School of Medicine, 21st and H Streets, N.W., Washington, D. C., September 25, 1958. The meeting, which is being held in cooperation with the University and the Medical Society of the District of Columbia, is open to all physicians, including graduate and undergraduate students of medicine. Registration will be optional and free of charge. The program, which follows, has been arranged by authorization of the Council. H. D. Kautz, M.D., *Secretary.*

1:15 p. m.: Welcome
- Dr. John Parks, Dean, George Washington University School of Medicine
- Dr. James W. Watts, President, the Medical Society of the District of Columbia and Professor of Neurological Surgery, George Washington University School of Medicine
- Dr. Hugh H. Hussey Jr., Member, A. M. A. Board of Trustees and Dean, Georgetown University School of Medicine

1:30 p. m.: Opening Remarks by the Chairman-Moderator
- Dr. Thomas McP. Brown, Member, A. M. A. Council on Drugs, Executive Officer of the Department and Eugene Meyer Professor of Medicine, George Washington University School of Medicine

1:45 p. m.: *Steroid Therapy in Endocrine Disorders*
- Dr. John E. Howard, Associate Professor of Medicine, Johns Hopkins University School of Medicine

2:05 p. m.: *Steroid Therapy in Rheumatoid Diseases*
- Dr. L. Maxwell Lockie, Professor and Head of the Division of Therapeutics, University of Buffalo School of Medicine

2.25 p. m.: *Steroid Therapy in Systemic Infections*
- Dr. Monroe J. Romansky, Professor of Medicine, George Washington University School of Medicine

2:45 p. m.: *Steroid Therapy in Skin Disorders*
- Dr. Richard B. Stoughton, Director of Dermatology, Western Reserve University School of Medicine

3:05 p. m.: *Steroid Therapy in Surgical Patients*
- Dr. Warren H. Cole, Professor of Surgery and Head of the Department, University of Illinois College of Medicine

3:25 p. m.: *Steroid Therapy in Ophthalmic Lesions*
- Dr. Irving H. Leopold, Professor and Head of the Department of Ophthalmology, University of Pennsylvania, Graduate School of Medicine

3:45 p. m.: Intermission (15 minutes)

4:00 p. m.: *Panel Discussion of Adrenal Steroid Therapy*
- Moderator: Dr. Brown
- *Panelists:* Drs. Howard, Lockie, Romansky, Stoughton, Cole, and Leopold

The panel will open the preceding presentations to general discussion and will consider questions from the audience.

CHEMICAL LABORATORY

The Chemical Laboratory has authorized publication of the following statement.
Walter Wolman, Ph.D., *Director.*

Monographs of tests and assays for new and nonofficial drugs adopted by the Chemical Laboratory of the American Medical Association represent an expression of opinion as to what might constitute adequate tests and assays to serve as a reference guide to those interested in the identity and quality of a new and nonofficial drug.

Completed monographs are publish [illegible] ecome journal *Drug Standards* for those [illegible] ical Association. details of the procedure [illegible] lowing drugs have appeared in the March-April, 1958, issue of that journal, except for the mon graph on fludrocortisone acetate which appe in the January-February, 1958, issue. Th [illegible] tion of the listed pharmaceuti [illegible] nished les a

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COMMITTEE ON MEDICOLEGAL PROBLEMS

HANDWRITING, SPEECH, AND BEHAVIOR CHANGES

Emil Bogen, M.D., Olive View, Calif.

This report is chapter 8 from a manual, being prepared by the Committee on Medicolegal Problems, dealing with medical and legal procedures involved in the use of chemical tests for intoxication.

The reliability, accuracy, and specificity of the various chemical tests for the alcoholic content of the breath, blood, urine, or other materials have been extensively determined. The correlation between the level of alcohol in the body fluids and the physiological and psychological reactions of the subject have been verified by a multitude of observers. The legality of such examinations has been established not only by scholarly briefs and local, state, and federal court decisions but also by specific legislative enactments.

In any particular instance, however, the possibilities of error in the collection, identification, analysis, and recording of results of the tests may cast doubt on their applicability. The bare report of a laboratory finding may fail to convince a judge or jury in the absence of confirmatory clinical data, especially in the face of a stout denial on the part of the culprit and the array of witnesses who testify to his sobriety. In every case, therefore, it is important that a modicum of observations should be made by the arresting officer and the examining

and the results recorded to support the
the chemical tests. Motion pictures,
ic recordings, and holographic samples
iting form additional useful exhibits in
tested cases.

ished face, red nose, congested conjunctiva,
ng peripheral vasodilatation, a fast bounding
e, deep or rapid respiration, and dilated pupils
dicating general excitation or the reverse during the later depressed stages, and hiccups, vomiting, or other visceral effects of alcoholic liquors should be noted. Such symptoms may arise from many other causes, but these may be often excluded by other information and generally are consistent with the chemical findings.

Behavior Change

tant clinical evidences of alco-
sought in the character-
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sphere,

ceptible alterations in judgment and disposition through the various manifestations of central and peripheral nervous disturbances to the deepening stupor and coma which may eventuate in death.

The psychic changes are associated with lowering in the sensory sensitivity with a rise in the threshold of sensation or a lessening of central attention, so that a person is not as conscious of what is happening around him or even of what he is doing himself. The reaction time is prolonged and reflex irritability lessens. Lessening in muscular coordination represents impaired nerve conduction from the brain to the muscles rather than mere muscular weakness.

The earliest influences of alcohol, with blood levels of less than 0.1% are usually so slight as to be readily overlooked. The diminution in inhibitions and social restraints may be at first manifested in slight departures from good taste and manners and lessening in self-control and consideration for others. Affective changes may lead to alterations in mood and disposition, with a feeling of euphoria and good fellowship, along with an increased confidence in one's mental and physical prowess which may lead to dangerous recklessness. At the same time attention, observation, deliberation and judgment, and self-criticism may be blunted and suggestibility and impulsiveness increased. Accidents and crimes may result, therefore, from levels of blood alcohol at which sensory or motor changes remain imperceptible unless delicate measurements are compared with careful observations made previously or later in the absence of alcohol.

In the so-called stage of excitement, when the concentration of alcohol passes 0.1%, self-consciousness and self-control diminish. Some persons become exalted, gay, and garrulous and others sentimental, affectionate, and confidential. Still others become boasting and boisterous or suspicious and bellicose, while some seem depressed and become sluggish, quiet, and sleepy without showing the more usual excitation. There may be emotional instability with sudden shifts from hilarious merriment to maudlin weeping, demonstrative affection
abusive pugnacity. Disorderliness, dirtiness,
and slovenliness ay appear. Hearing
less a cular movements
evidence

muscular incoordination and beginning clumsiness can be detected by careful observation or simple tests.

In the more advanced stages of drunkenness, with blood levels of 0.2% or 0.3%, the mental obfuscation is intensified and incoordination becomes more prominent. The disposition and personality changes become greater; there may be flight of ideas and pressure of activity or sluggishness and loss of attention and response. Dizziness, double vision, or roaring in the ears may develop, and the senses of touch and pain as well as of sight and hearing may be blunted and reflex activity increased. The movements become incoordinated or uncontrolled, the subject may be unable to stand erect without swaying or falling. When his eyes are closed, his gait may become staggering, he cannot walk in a straight line or place his finger unhesitatingly on a desired point. Fumbling movements of the fingers and hands, with the familiar difficulty in inserting a key in a keyhole, or lighting a cigarette, or in buttoning a garment may be noted.

As the intoxication deepens the subject reacts less and less well to the external environment, the early stages of apparent excitation disappear and the stage of apathy and general inertia develops. Ataxia and general incoordination become marked; the subject becomes unable to stand or even to sit up. Consciousness becomes impaired so that only strong stimulations elicit a response. A semistuporous or even comatose condition may ensue, with complete unconsciousness and paralysis and eventual fatality.

Speech Changes

The same kind of changes in thought, feeling, sensation, and action which are seen in general behavior under the influence of alcohol may also be recognized in the activities concerned in speech. These are less noticeable when the patient merely states his name or other familiar material, but they may be elicited on reading or repeating test phrases and may be more noticeable on spontaneous speech as in narrating the circumstances preceding the examination. The first changes in the speech reflect the early changes in the psychic sphere. With lessening of inhibitions, profanity, epithets, and indecent words and gestures are used even in the presence of women or children. The speech is apt to become louder and more rapid and voluble, though occasionally it may become slower and appear stilted. Impairment in enunciation, with slurring and coarsening of speech and the running of words together may be noted. As intoxication develops, the content of speech becomes less restrained, relevant, and intelligent. Slurring and thickening in speech, with lessening in control of the vocal cords, may increase. Mental confusion, may be reflected in omissions, transpositio[illegible] become tions, repetitions or substitutio[illegible] Medical Association. or syllables, [illegible]

spasmodic or sporadic inarticulate sounds, snoring, or stertorous breathing until no further sounds may be elicited.

Handwriting Changes

The same processes which produce alterations in speech under the influence of alcohol may be expected to result in analogous changes in the handwriting. The preservation of specimens of handwriting which demonstrate these changes may often supply valuable evidence in a contested case. Even the signature may be affected in overintoxication, but copying from a sample or from dictation, or preferably an extemporaneous writing, such as an account of his condition, are more apt to demonstrate significant alterations. The choice of words and subjects in writing shows the same loss of inhibitions which may be noted in speech and actions. Handwriting at an early stage is apt to be larger and heavier and more ornate than usual. There may be a tendency for the writing to rise or fall, and to vary in the size of letters. Later the changes become more marked and the letters less legible, with more misspellings, crossing out or erasures, overwriting, and with excess duplications, insertions, omissions, or transpositions of strokes, letters, or words similar to the corresponding changes in the enunciation of spoken language. The writing becomes more scrawling and illegible and eventually merely a sprawling line before the person becomes entirely unable to scribble.

Delayed effects of alcoholic intoxication may be seen in persons with alcoholic psychoses, in delirium tremens, in persons recovering from a bout, and in inebriates, whether chronic alcoholics or periodic drinkers. But these effects are to be noted chiefly in the content of behavior, speech, and writing and in the weakness or tremors which may be present, and the incoordination of the acute phases is less often or conspicuously noted.

Individual variations in manifestations of alcoholic intoxication are marked. Loss of coordination which may make a clerk stagger without affecting his handwriting may greatly impair a patrolma[illegible] orthography without affecting his gait. An e[illegible]enced automobile driver may be too drunk to [illegible] and yet succeed in driving long distances mec[illegible]ically, but without remembering any details of [illegible] trip, the condition being comparable to sleepwalking. Under these conditions he would not be prepared for unusual emergencies or particularly parking or backing his car. The range of anest[illegible] stages under alcoholic influence is so gr[illegible] degree of central nervous dist[illegible] Co[illegible] related to the concentratio[illegible] that an experienc[illegible] with t[illegible] rather closely [illegible] ization that the [illegible]eloping a exists fr[illegible] the over-all im distribution problem. It urg coming supplementary report earliest date possible, and r taken at this time.

Legislation and Public Relations
R. J. Azzari, *Chairman*, New York
Paul D. Foster, California
Francis F. Holland, Florida
J. Arnold Bargen, Minnesota
Dan C. Ogle, United States Air Force

Medical Education and Hospitals
Norman A. Welch, *Chairman*, Massachusetts
Peter Murray, New York
Wesley W. Hall, Nevada
Walter C. Bornemeier, Illinois
Willard A. Wright, North Dakota

Medical Military Affairs
Troy A. Shafer, *Chairman*, Texas
W. Vinson Pierce, Kentucky
Francis M. Forster, Section on Nervous and Mental Diseases
Archie O. Pitman, Oregon
H. Thomas McGuire, Delaware

Miscellaneous Business
Frank A. MacDonald, *Chairman*, California
John J. Masterson, New York
Lucien R. Pyle, Kansas
J. M. Pfeiffenberger, Illinois
Charles F. Strosnider, North Carolina

Reports of Officers
James Q. Graves, *Chairman*, Louisiana
Earl W. Mericle, Indiana
B. E. Montgomery, Illinois
Charles G. Hayden, Massachusetts
Harold Gardner, Pennsylvania

Rules and Order of Business
Joseph C. Griffith, *Chairman*, Wisconsin
Ezra A. Wolff, New York
Louis C. Theobald, New Hampshire
B. W. McNease, Alabama
Philip Foisie, Massachusetts

Sections and Section Work
Wilkie D. Hoover, *Chairman*, Oklahoma
H. Kenneth Scatliff, Illinois
Winfred A. Showman, Section on Dermatology
Jesse W. Read, Washington
Kenneth B. Castleton, Utah

ellers
Earl Malone, New Mexico
Albert T. Sudman, Wyoming
Milo Fritz, Alaska
James Feldmayer, California
Paul F. Orr, Ohio

Sergeants at Arms
C. Paul White, *Master*, Illinois
Eustace A. Allen, Georgia
L. O. Simenstad, Wisconsin

[illegible] **of New Delegates.**—The new delegates intro- [illegible] Robert E. Hastings, Arizona; Donald A. [illegible] enry Gibbons, California; Harlan A. [illegible] er, Connecticut; J. W. Cham- [illegible] Indiana; George H. [illegible] *Michigan;* John R. [illegible] Paul F. Orr, [illegible]

In Memoriam.—The Speaker presented the following list of members of the House of Delegates and/or officers of the American Medical Association, notice of whose death had been received since the 1957 Annual Meeting. The dates following the names indicate the years of service in the House or as officers of the Association.

Bates, W. A., South Dakota, 1933-1935.
Bailey, Clark, Kentucky, 1945-1950; 1953-1957; Vice-President, 1954-1955.
Blaine, Walter C., Illinois, 1919.
Blankenhorn, Marion A., Ohio, Vice-Chairman, Section on Practice of Medicine, 1934-1935; Chairman, Section on Internal Medicine, 1948-1949.
Block, W. H., Louisiana, 1922-1923.
Boswell, Henry, Mississippi, 1922-1924; 1926; 1928.
DeBuys, L. R., Louisiana, 1917-1918; 1921.
DeVigne, Harry C., Alaska, 1926.
Donaldson, Walter F., Pennsylvania, 1923-1927; 1929-1933; 1935-1948.
Drennen, W. E., Alabama, 1915.
Ellis, E. F., Arkansas, 1930-1931.
Fawcett, Ivan, West Virginia, 1938-1949.
Fitzgibbon, John H., Oregon, 1936-1943; Member, Board of Trustees, 1945-1950.
Fouts, Roy W., Nebraska, Vice-Speaker, House of Delegates, 1938-1945; Speaker, House of Delegates, 1946-1947; Vice-President, *1948-1949.*
Giordano, Alfred S., Indiana, 1945-1951; Vice-Chairman, Section on Pathology and Physiology, 1949-1950.
Harris, C. H., Texas, 1906.
Hammond, Roland, Rhode Island, 1924-1928; 1930-1933; 1937-1938.
Hart, W. Lee, U.S. Army, *1928; 1930.*
Kindleberger, C. P., U.S. Navy, 1930.
Kump, Albert B., New Jersey, 1953-1955.
Lockwood, Ira Hiram, Missouri, Vice-Chairman 1950-1951, and Chairman, 1951-1952, Section on Radiology.
Matas, Rudolph, Louisiana, 1903; Chairman, Section on Surgery and Anatomy, 1907; Vice-President, 1932-1933.
McCracken, J. H., Texas, 1912.
Mellen, Dan, New York, 1956-1957.
Orton, Henry B., New Jersey, Chairman, Section on Laryngology, Otology, and Rhinology, 1948-1949.
Paryzek, Harry V., Ohio, 1942; 1944-1946.
Peacock, Cassius Lee, Louisiana, 1944; 1946.
Pedersen, V. C., New York, 1910.
Pruitt, Marion C., Georgia, 1942.
Rice, E. E., Oklahoma, 1911.
Risser, Arthur S., Oklahoma, 1941-1944.
Robinson, George W., Missouri, 1913; 1924-1927.
Ross, Alonzo A., Texas, 1930-1933; 1935-1940.
Schmidt, Louis E., Illinois, Secretary, *1912-1915,* and Chairman, 1916, Section on Genito-Urinary Diseases.
Senear, Francis E., Illinois, Secretary, Section on Dermatology and Syphilology, 1929-1933.
Shephard, John Hunt, California, 1933; 1935-1936.
Smith, Scott Lord, New York, 1945-1951.
Sprague, B. H., South Dakota, 1918.
Thigpen, Charles A., Alabama, 1916.
White, John Hutchings, Oklahoma, 1913-1914.
Winslow, Floyd S., New York, 1933-1952; 1954-1957, Member, Council on Constitution and Bylaws.

The House rose in silent tribute to the memory of its deceased *members.*

Distinguished Guests.—The following distinguished guests were introduced by the Speaker:
Mr. E. D. Bronson, American Bar Association
Dr. B. C. Kingsbury Sr., American Dental Association
State [illegible] your [illegible] n and Edwin L. Crosby, American Hos-
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Dr. Walter Hedgcock, British Medical Association
Dr. A. D. Kelly, Canadian Medical Association
Dr. S. C. Sen, Indian Medical Association
Mrs. Muriel C. Henry, National League for Nursing
Mr. Harry P. Loynd, Pharmaceutical Manufacturers Association
Mr. Louis J. Fischl, American Pharmaceutical Association
Miss Evelyn M. Hamil, American Nurses Association

Woman's Auxiliary.—The President of the Woman's Auxiliary, Mrs. Paul C. Craig, addressed the House of Delegates indicating that future plans of the Auxiliary will be focused on the correlation and continuity of its activities through increased communication with the state auxiliaries as well as with organizations whose interests dovetail with those of the Auxiliary.

The Reference Committee on Reports of Officers, to which the address was referred, was impressed with the progress the Auxiliary had made and expressed the gratitude of the House for its outstanding job.

Address of the President.—Dr. David B. Allman, President, delivered his address, which was referred to the Reference Committee on Reports of Officers. Dr. Allman summarized accomplishments of the past year; he pointed out that the A. M. A. had taken a positive attitude in the field of federal legislation affecting the health and safety of the American people, and expressed the following hope: (1) that every physician will rededicate himself to the service of mankind and that every medical society will strengthen its disciplinary system to prevent the very few from besmirching the vast majority; (2) that members of the medical profession—as American citizens—be high-minded, incorruptible men and women above reproach; (3) that the House of Delegates and the entire medical profession continue to have a profound sense of duty and of social justice; and (4) that the final criterion of any contemplated step be the greatest good for the greatest number.

The Reference Committee expressed its agreement with the hopes of Dr. Allman and congratulated him on his report.

Address of the President-Elect.—Dr. Gunnar Gundersen, President-Elect, delivered his address, which was referred to the Reference Committee on Reports of Officers. Dr. Gundersen urged that active cooperation be given to the Committee to Study A. M. A. Objectives and Basic Programs and stated that closer liaison and constructive planning in conjunction with specialty groups and other medical organizations is essential to achieve the kind of medical unity which will serve the best interests of both medicine and the public. Dr. Gundersen further stated (1) that a reevaluation of the A. M. A. legislative situation is necessary, which will involve a reorganization of the Washington Office; (2) that the A. M. A. intends to expand its states relations and make every effort to strengthen the bonds between all levels of medical organization, national, state, and local; and (3) that another matter of concern is the better coordination of the Association's research program.

The Reference Committee commended Dr. Gundersen on his ability to express himself and joined him in urging closer liaison and constructive planning in conjunction with specialty groups and other medical organizations.

Report of the Secretary.—Dr. George F. Lull, Secretary, presented his report, which was referred to the Reference Committee on Reports of Board of Trustees and Secretary.

Application of Virgin Islands Medical Society

On June 2, 1958, the Secretary received a communication from the Virgin Islands Medical Society dated May 24, 1958, which constituted an application by the Society to become a constitutent society of the American Medical Association. Accompanying the application was an oath of allegiance to the Constitution, Bylaws, and Principles of Medical Ethics of the Association, signed by all of the members of the Virgin Islands Medical Society, together with a copy of its Constitution and Bylaws.

The Reference Committee, although cognizant that the chartering of a new constituent society is not a common event, believed that the Society had complied with the necessary requirements, and therefore recommended that the admission of the Virgin Islands Medical Society as a constituent society of the American Medical Association be approved in principle. It suggested that this matter be referred to the proper department of the A. M. A. for favorable action after all the pertinent facts have been obtained with the advice and counsel of the Law Department.

Resignation of Dr. Mulholland

The Secretary reported that he had received the resignation of Dr. Henry B. Mulholland from the Council on Medical Service effective June 25, 1958.

Proceedings of the House

Dr. Lull reported that the June 1957 Proceedings of the House of Delegates had been mailed to members of the House and others during the first part of June, and that the December 1957 Proceedings were mailed during the latter part of June. He also pointed out that the format of the Proceedings had been revised and comments and suggestions would be welcomed.

The Reference Committee approved of the revised format of the Proceedings and commended the Secretary's Office for instituting these changes.

Report of Board of Trustees.—The Speaker referred items in the report of the Board of Trustees as printed in the Handbook of the House of Delegates (see THE JOURNAL, May 17, pages 343-345) as indicated below:

Reference Committee on Reports of Board of Trustees and Secretary
Matters Referred by House of Delegates
Financial Statement

Matters Referred by House of Delegates

Aviation Medicine.—The Reference Committee noted that the Board complied with the directive of the House, adopted at its 1957 Philadelphia Meeting, which recommended that a completely adequate and competent medical department be established in the Civil Aeronautics Administration, directly responsible to the C. A. A. Administrator. A statement had been sent to Sen. Warren G. Magnuson urging the passage of S. 1045, 85th Congress, to accomplish the purpose of the directive. The committee commended this action of the Board, but recommended continued efforts on the part of the Association to secure the enactment of appropriate legislation because of the rapidly expanding activities in the field of aviation medicine.

Identification of Hospital Solutions.—The Reference Committee approved the action of the Board in instituting a study of this subject by the Council on Drugs. The complete report of the Council was published in THE JOURNAL (April 19, page 1988).

Vaccine Distribution.—The Reference Committee called the attention of the House to the brief résumé of the situation. It was in agreement with the Board of Trustees and the Committee on Influenza that the Association should exercise leadership in developing a complete stand-by program and emphasized the over-all importance of the whole vaccine distribution problem. It urged the completion of the forthcoming supplementary report on mass immunization at the earliest date possible, and recommended that no action be taken at this time.

Rehabilitation Consultation Service.—The Reference Committee agreed with the need for the establishment of an integrated rehabilitation consultation service to the constituent medical societies, and recommended that the House reaffirm its action of the June 1957 meeting approving the project and urging its early implementation.

American Retirement Plan.—The Reference Committee reviewed the report of the Board and agreed with its opinion that it would not be feasible for the American Medical Association to conduct an investigation of the Social Security System. However, although the Committee recognized the difficulties that would be encountered in persuading the Congress to initiate such an investigation, it believed that renewed effort should be made to accomplish the objectives of the resolution. It recommended therefore that the matter again be considered by the Board of Trustees.

Radioactive Isotopes.—The Reference Committee enthusiastically recommended the appointment of the Committee on Atomic Medicine and Ionizing Radiation as reported by the Board, and further recommended that the committee concern itself with informing the American public from time to time on all phases of radiation hazards, including "fall-out," having to do with the health of the nation.

Financial Statement

The Reference Committee reviewed the financial statement of the Association as rendered by the Board of Trustees and the auditor's report. The committee noted with satisfaction that membership dues were received from 138,600 members in 1957, as compared with receipts from 136,000 in 1956. Careful supervision and management of the Association's resources have resulted in an increasing return on investments, from a yield of 2.96% in 1956 to 3.16% in 1957.

The committee commended the Board of Trustees, the Treasurer, and the General Manager for their sound management of the fiscal affairs of the Association, which has resulted in a substantial increase in its net worth.

Supplementary Reports of Board of Trustees

Supplementary reports were presented to the House by title or by the Chairman, Dr. E. S. Hamilton:

A. Preparation for General Practice.—The Committee on ation for General Practice, a study group of repre- ves of the A. M. A. Council on Medical Education spitals, the Association of American Medical Col- the American Academy of General Practice, and the cialty areas, made a preliminary report to present the rrent thinking of the committee.

The committee report outlined general considerations; as working definition of the medical practice involved the following statement was adopted by the committee: "General Practice is that aspect of medical care performed by the Doctor of Medicine who assumes comprehensive and continuing responsibility, commensurate with his professional competence, for the patient or his family." It suggested that a new graduate educational program for general practice be developed and that primary consideration be given to an education experience enabling the physician to provide medical care for all members of the family irrespective of age. The graduate program proposed as preparation for general practice is designed to be more comprehensive than the internship in regard to patient responsibility, educational content, and continuity of experience.

Under existing circumstances, the committee believes that a period of at least two years of formal hospital training following attainment of the medical degree is necessary in preparation for general practice of medicine. The two-year period would be minimal even where other factors of educational quality and content are optimal. Such a two-year experience, in the opinion of the committee, would furnish a sound base for further graduate medical education in any field.

The committee recognized that the thoughtful cooperation of specialty groups will be required to implement a sound program of preparation for the general practice of medicine and indicated that formal consultations with such specialty groups will be held as an essential preliminary to the more specific and detailed planning of the proposed minimal program. It expects to include consideration as to whether this program of preparation for general practice should be called an internship or a residency, or identified in some other manner. The committee, in cooperation with specialty groups involved, will give consideration to the type of recognition that may be developed for those individuals who successfully complete a part or all of this proposed program.

The Reference Committee on Medical Education and Hospitals recommended that full consideration of the preliminary report be given by all members of the House of Delegates, and that comments or suggestions be submitted to the Committee on Preparation for General Practice. It commended the efforts and studies of the committee and awaits with interest the completion of its studies and the final report.

B. Commission on Medical Care Plans.—The commission made its sixth progress report indicating that, although it had hoped to have its final report completed by this date, it was unable to finalize its report at the April 11-13 meeting. However, the statistical portion of the report, designated as Part II, Statistical Appendices and Background Materials, had been completed and distributed to members and alternates of the House of Delegates. It is anticipated that the remainder of the report containing other findings, as well as conclusions and recommendations by the Commission, will be completed for consideration at its meeting in September, and subsequently submitted to the Board for review.

The Reference Committee on Insurance and Medical Service approved the progress report and commended the Commission on Medical Care Plans for the tremendous task it has undertaken. The committee indicated that members of the House were favorably impressed with the voluminous amount of data collected as evidenced by the section of the report entitled Part II. It was felt that the studies of this Commission would assist in the solution of the numerous pressing problems discussed at reference committee hearings. The committee, recognizing the desire of the membership for a final report from the commission, urged that the group do its utmost to complete its final report so that it may be considered at the 1958 Clinical Meeting.

C. Resolutions 20 and 24, adopted in December, 1957.—The Board of Trustees following the December, 1957, meeting of the House of Delegates, referred resolutions 20 and 24 concerning the relationship of the medical profession with the United Mine Workers Welfare Fund and with other "third party" mechanisms, to the Council on Medical Service and the Council on Industrial Health for study and recommendations.

A report was prepared by the Committee on Medical Care for Industrial Workers, a joint committee of the two councils; it was approved by the two councils, and submitted to the Board of Trustees by the Council on Medical Service on May 18, 1958. The report expressed agreement with the recommendation of resolution 20 that "medicine's side of this controversy should be presented to the medical profession and subsequently to the public." However, it was suggested that further consideration should be given to the following three specific aspects of the problem before an educational campaign is initiated:

1. Scope and Timing of Educational Campaign.
2. Definition of Term "Freedom of Choice."
3. State or National Educational Program.

The Board of Trustees considered and concurred in the above suggestions but recommended that final action on these resolutions be postponed until the final report of the

Commission on Medical Care Plans is received, inasmuch as two of the items referred to have been the subject of intensive study by the commission.

The Reference Committee on Insurance and Medical Service, although concurring in the opinion of the Board of Trustees that final action on these resolutions should be postponed until the final report of the commission is received, believed that in the interim the Board should implement the purposes of resolutions 20 and 24 to the greatest degree consistent with good judgment, and recommended that the Board consider authorization to the Department of Public Relations to publicize in areas where indicated by local conditions the first part of resolution 20 which reads as follows:

"RESOLVED, that the House of Delegates condemns the current attitude and method of operation of the U. M. W. A. Welfare and Retirement Fund as tending to lower the quality and availability of medical and hospital care to its beneficiaries."

The House of Delegates, however, after considerable debate, adopted the following amendment made on the floor: "that this section of the Reference Committee report be amended to show that our A. M. A. Headquarters staff is directed, under supervision of the Board of Trustees, to proceed *immediately* with the campaign which was originally ordered at Philadelphia last December, that no further delays will be tolerated, and that the Council on Medical Service be relieved of any further responsibility in this matter."

D. AMA-ABA Liaison Committee.—In 1957 at the invitation of the President of the American Bar Association, the Board of Trustees of the A. M. A. appointed three representatives to serve on a joint national medicolegal liaison committee. The Board reported that since its formation the committee has held three meetings at which the following subjects were considered: (*a*) preparation of a national interprofessional code; (*b*) encouragement of state and local medicolegal meetings; (*c*) medical professional liability problems, including preliminary review of malpractice claims by local boards composed of doctors and lawyers, (*d*) medicolegal forms; and (*e*) the possibility of establishing medicolegal courses in law schools and medical schools.

As a result of its deliberations with respect to medicolegal meetings, it is the intention of the joint committee to devise a plan whereby a panel of qualified attorneys and physicians will be made available as speakers to participate at medicolegal meetings at the local, state, and national level. The joint committee prepared and submitted for approval a proposed National Interprofessional Code for attorneys and physicians, intentionally prepared in general terms to permit its adaptation in the light of local conditions and circumstances. The Code will also be presented for approval to the Board of Governors and the House of Delegates of the American Bar Association at its meeting in August, 1958.

The Reference Committee on Miscellaneous Business wholeheartedly approved the report of the joint committee as transmitted by the Board, complimented the committee on the excellence of its report, and recommended the adoption of the proposed interprofessional code. It also expressed the belief that it will be extremely helpful in improving interprofessional relationships between physicians and attorneys.

E. Hypnosis.—The Board submitted an informational report on hypnosis which was developed by its Council on Mental Health acting as a Committee of the Whole to study the medical use of hypnosis. The report stated (1) that the use of hypnosis has a recognized place in the medical armamentarium and is a useful technique in the treatment of certain illnesses when employed by qualified medical and dental personnel; (2) that teaching related to hypnosis should be under responsible medical or dental direction; (3) that as certain aspects of hypnosis still remain unknown and controversial, active participation in high level research by members of the medical and dental professions is to be encouraged; and (4) that the use of hypnosis for entertainment purposes is vigorously condemned. The Board in transmitting the report indicated that it would be submitted for publication in a specialty journal.

The Reference Committee on Hygiene, Public Health, and Industrial Health approved the report and commended the Council on Mental Health for its work.

The House of Delegates adopted the Reference Committee report with an amendment that the hypnosis report be published in THE JOURNAL with the original bibliography appended.

F. Advertising of Over-the-Counter Medications.—In 1957 the House of Delegates adopted two resolutions dealing with television and radio advertising of "patent medicines." One recommended that the Board augment its liaison with the television and radio industry and urge a more careful screening of broadcast material in an effort to eliminate offensive and misleading advertising; the other recommended that the Board continue vigorous opposition to the objectionable advertising pertaining to health and that it support voluntary activities which would accomplish this end.

At the request of the Board, the Department of Public Relations initiated a study of the problem and made the following recommendations to the Board: (1) that the American Medical Association join with other interested groups in setting up an expanded voluntary program, coordinated by the National Better Business Bureau, which will seek to eliminate objectionable advertising of over-the-counter medicines; (2) that the American Medical Association counsel with the National Better Business Bureau in the selection of a physicians' advisory committee; (3) that the established facilities of the American Medical Association, such as the Chemical Laboratory, the offices of the various scientific councils, and the Bureau of Investigation, be made available, so far as is feasible, to aid in the carrying out of this program; (4) that the Public Relations Department continue its liaison work with the various groups involved and assist in the development and operation of this program in any way possible; and (5) that the American Medical Association become a sustaining member of the National Better Business Bureau, giving evidence of its willingness and desire to support this organization in its worthwhile activities.

The Board of Trustees adopted the first four recommendations and reported that it had the fifth recommendation under consideration.

The Reference Committee on Hygiene, Public Health, and Industrial Health endorsed implementation of the recommendations and considered monies spent in this endeavor most justified.

G. Report of AMA–AHA Liaison Committee.—The Board submitted the second report of the joint committee of the American Medical Association and the American Hospital Association to study in-hospital medical professional liability problems. The committee, appointed in 1957, has proceeded with the projects as outlined in its initial report and submitted to the House at its December, 1957, meeting. The committee feels that the results which have been realized thus far are encouraging, and it can fulfill a definite need in the analysis of joint hospital-medical professional liability problems and in the formulation of a sound prevention program which can be implemented by constituent associations and by individual hospitals.

The Reference Committee on Insurance and Medical Service commended the work of the joint committee and, in particular, the efforts of the committee in the matter of the appointment of similar joint professional liability committees at the state and local level. It urged continued study of the problem and the dissemination of additional information at the grass roots level.

H. Status Report of Activities of Commission on a National Emergency Medical Care Plan.—An informational report on the activities of the commission was submitted by the Board of Trustees. The report outlines in detail background information on the formation of the research program and initiation of the plan of study to establish criteria for the provisions of medical care of the surviving population in the event of an enemy attack on the nation.

Provisions of the contract between the A. M. A. and the Federal Civil Defense Administration are outlined: that the A. M. A. "shall study, develop, and recommend the planning, training, and operational organization needed as a basis for a National Emergency Medical Care Plan for the treatment and care of casualties and noncasualties prior to, during, and after a hypothetical 20 megaton ground burst thermonuclear attack upon a selected geographical area or areas in the United States." Work and services under the contract will be completed on submission to the Federal Civil Defense Administration of the final report and recommendations not later than Nov. 26, 1958.

The Commission on a National Emergency Medical Care Plan was set up under the aegis of the Council on National Defense, the Council on Medical Service, and two physicians from the St. Paul-Minneapolis area, which was selected as the site for the study project. Generally, it was considered that the matching of all available medical resources against the total medical requirements resulting from such an attack would provide a fair test.

Three task forces of the commission have been created composed of representatives from national health and medical organizations. They are (1) Task Force on Organization which shall give consideration as to how organized medicine should best function to participate in both planning and operational roles; (2) Task Force on Personnel Training and Utilization which is concerned with the education and training phase of the project, giving consideration to the study and recommendations for the development policies, means, methods, and programs designed to prepare all health and medical services personnel, professional and nonprofessional, for operational capability in the event of enemy thermonuclear attack; (3) Task Force on Emergency Medical Care which has the responsibility of preparing recommendations concerning the management and care of mass casualties under conditions of limited personnel, supplies, and facilities.

Preliminary reports of the task forces are to be completed during July, 1958, and submitted to the full commission in August, 1958. Concurrently, a report of the field study phase to be completed by staff members of the commission and, subsequently, a report of the completed study project will be submitted to the Council on National Defense for its review and referral to the Board of Trustees.

It is anticipated that the study project will be completed in November, 1958, in accordance with the terms and conditions of the AMA-FCDA contract.

The Reference Committee on Medical Military Affairs recommended the adoption of the report.

I. Participation in Local Medical Societies by Physicians Employed in Federal Service.—The Board of Trustees, following the December, 1957, meeting of the House of Delegates, referred to the Council on National Defense resolution 29 on the problem of assisting in the accomplishment of the objective of securing active participation in local medical societies (especially where dues are charged) of physicians employed in the federal government, as long as nonpaying membership in the A. M. A. is offered.

The Council and its Committee on Military Medical Affairs decided that because of the variance in local and state society rules and regulations and the frequent change of assignments of medical officers of the several federal medical services, there is no simple or practical solution which can be recommended at this time. The Board of Trustees concurred in the opinion of the Council.

The Reference Committee on Medical Military Affairs recommended the adoption of the report.

J. Accreditation Program for Schools of Nursing.—The Board of Trustees called attention to the fact that, through its Committee on Nursing and its representatives on the National Joint Commission for the Improvement of the Care of the Patient, it has maintained close contact with the nursing profession and that recently the National League for Nursing approved of additional representation from the A. M. A. on its accreditation committee. The Board feels that this will assist it in its efforts to work closely with the nursing profession in this important area.

The Reference Committee on Medical Education and Hospitals recommended approval of the report.

K. Medical Rating of Physical Impairment.—A guide for use in the evaluation of impairment to the visual system, the second in a series, was completed by the Committee on Medical Rating of Physical Impairment and was accepted by the Board. It will be published in a future issue of THE JOURNAL for the information of the profession.

The Reference Committee on Hygiene, Public Health, and Industrial Health recommended approval of the report.

L. A. M. A. News.—Recently the Board of Trustees approved the establishment of a newspaper to be published bi-weekly for distribution to approximately 200,000 physicians. The newspaper will be edited with the idea of keeping the physician informed in the medicoeconomic field, concentrating on news not now carried in other A. M. A. journals. It is planned that the first issue will be distributed on Sept. 22.

The Reference Committee on Reports of Board of Trustees and Secretary recommended the adoption of the report.

Report of Council on Medical Education and Hospitals.—The Speaker referred the report of the Council on Medical Education and Hospitals as printed in the Handbook of the House of Delegates (see THE JOURNAL, May 17, pages 345-347) to the Reference Committee on Medical Education and Hospitals.

The Reference Committee recommended the adoption of the report of the Council which includes approval of a revision of (1) the "Essentials of an Approved Internship" and the "Essentials of Approved Residencies and Fellowships"; (2) the section on "Scope of Training" of the "Essentials of Approved Residencies and Fellowships" in otolaryngology; and (3) the "Essentials of an Acceptable School of Medical Technology."

Report of Council on Medical Service.—The report of the Council on Medical Service covered four primary subjects and was referred to the Reference Committee on Insurance and Medical Service:

(A) Resolution No. 18 (1957 Clinical Session) on Vendor System of Payment. This resolution called for endorsement by the House of Delegates of the ". . . direct or VENDOR system of payments to physicians from public funds for professional services rendered to Public Assistance recipients."

The Council recommended that ". . . the House of Delegates (1) reaffirm the prerogative of the states to determine the allocation of these funds; (2) endorse, in principle, legislation in the Congress which, by amendment to the individual Social Security Act, would return this right to the individual states; and (3) direct the Board of Trustees to take positive action to implement this policy."

The Reference Committee recommended approval of Section A of the report.

(B) Suggested Guides for Medical Society Sponsored Voluntary Prepayment Medical Benefit Plans. It was recalled that the Council on Medical Service had a Seal of Acceptance Program during the years 1946 to 1954 which applied to health insurance plans sponsored or approved by medical societies. That program was based on standards adopted by the Council and approved by the House. When the House terminated the Seal of Acceptance program in June, 1954, it stated that ". . . the Standards and Principles will be maintained as guides for all groups operating or establishing plans."

In the intervening years it has seemed desirable to develop a new approach in the nature of "guides" to eliminate any possible reference to an acceptance or approval program. Accordingly, the Council's Committee on Prepayment Medical and Hospital Service prepared suggested guides for medical society sponsored voluntary prepayment medical benefit plans. The 10 suggested guides, as modified by the Council, were submitted to the House of Delegates for its consideration and approval. It was also indicated that guides for buyers or prospective purchasers of health insurance benefit programs are under consideration and will be reported on at a later date.

The Reference Committee commended the Council on Medical Service for its untiring efforts to produce a set of guides for medical society sponsored voluntary prepayment medical benefit plans. However, it indicated that testimony presented before the committee indicated that there is still diversity of opinion among members of the Council with reference to guide four of Section B. The committee therefore recommended that Section B of the Council's report be returned to the Council on Medical Service for further study and report at the 1958 Clinical Meeting.

(C) Suggested Guides for the Organization and Operation of Medical Society Committees on Aging. It was stated that during the past year the Committee on Aging had been urging medical socities to take an active interest in the problems of aging and has held regional meetings in Seattle, Dallas, District of Columbia, Birmingham, and Omaha to stimulate this interest. One of the objectives was the establishment of committees on aging in all constituent and component medical societies. To assist the societies, the Council submitted a set of "Suggested Guides for Medical Society Committees on Aging" to the House for its approval. The guides have been discussed at the regional conferences and are the result of suggestions from physicians in all types of practice.

The Reference Committee recommended the approval of Section C of the report.

(D) Recommendations regarding Hill-Burton Hospital Survey and Construction Program. A printed abstract report on the Hill-Burton study was attached to the report of the Council, representing the key portion of a 100-page mimeographed report prepared by the Committee on Medical and Related Facilities following two years of intensive research and field work. Both documents were approved by the Council on Medical Service. The report recommended that (1) the Hospital Survey and Construction Program should be continued although its objectives should be redefined and certain changes made to render it more effective; (2) the states be permitted to establish priorities in accordance with their individual needs; (3) all categorical grants be eliminated permitting the states to allocate funds to the various types of hospital and medical facilities according to their needs; (4) the term, "diagnostic or treatment center," should be eliminated from any listings in the Act; (5) the term, public health center, be eliminated from any listings in the Act; (6) there be established a program which would provide for federally guaranteed long-term loans at low interest rates for the construction or renovation of hospitals and nursing homes; (7) the Surgeon General be requested to appoint a physician in private practice as a member of the Federal Hospital Council and that this physician be selected from a list submitted by the American Medical Association; and (8) each state medical association take steps to obtain adequate representation on its own state hospital advisory council.

The Reference Committee was sincerely impressed with the report of the Hill-Burton study by the Committee on Medical and Related Facilities of the Council on Medical Service. It felt that the report, factual and complete, represents the type of work which redounds to the credit of the Association, and that all who contributed to its preparation are to be congratulated. The committee recommended approval of Section D of the report.

Special Report of Council on Constitution and Bylaws.—The special report of the Council on Constitution and Bylaws was referred by the Speaker to the Reference Committee on Amendments to the Constitution and Bylaws.

Reserve Officers—Indian Service

At the 1956 Clinical Session in Seattle, the House amended the Bylaws in two particulars. 1. It eliminated reference to the Indian Service from Chapter I, Section 2, relating to Service members because of the fact that the Indian Service is now a part of the Public Health Service. 2. It added to the same section reference to commissioned medical officers of the reserve components on extended active duty with the several branches of the armed forces and the Public Health Service so as to make such officers eligible for Service Membership. Similar changes had not been made in the Constitution. Reference to this situation was called to the attention of the House in June, 1957, but no action could then be taken because amendments to the Constitution must lay over for one session In order to eliminate these inconsistencies between the Constitution and the Bylaws the Council recommended adoption of the amendments to Article V, Section 2 of the Constitution.

The Reference Committee recommended the adoption of the recommended amendments to Article V, Section 2, of the Constitution, which would then read as follows:

"Article V—Members; Section 2—Service Members.—Service Membership shall be limited to regular commissioned medical officers and commissioned medical officers of the reserve components on extended active duty with the United States Army, the United States Navy, the United States Air Force, and the United States Public Health Service and the permanent medical officers of the Veterans Administration subject to the provisions of the Bylaws."

Service Members

At the December, 1957, session of the House of Delegates Resolution 7 on Service Membership was considered, and in view of the complexity of the question, which involves changes in the Constitution and Bylaws of the Association, was referred to the Council on Constitution and Bylaws for further study.

The Council considered this problem at its meeting in Chicago in March, 1958, at which representatives of the Secretary's office and the Membership Department of the A. M. A. were present. The Council also had the benefit of several written statements expressing the opinions of some of the constituent societies concerning Service Memberships, and of a full and free discussion of the historical basis for Service memberships and the various changes that have been made in that classification during the years. It was brought out that the Membership Department did, in the past, give Service Membership precedence over all other classification of membership when a doctor entered the regular Army or one of the reserve components, but that that procedure is no longer followed. Since January, 1957, an active member of a constituent society is retained in that classification if that is his desire and if the rules and regulations of the constituent society permit it.

tion. Members of the American Medical Association who have been dropped from the Membership roll for nonpayment of annual dues cannot be reinstated until such indebtedness has been discharged, but such indebtedness shall apply only to the one year of delinquency.

Division Two—Scientific Assembly

Chapter V.—Registration

Section 1. Registrants.—Only the following shall be permitted to register at any meeting:

(C) Residents and interns who are graduates of approved medical schools and who are certified to the Executive Vice-President of the Association by the superintendents of their respective hospitals.

(D) Medical students of approved medical schools who are certified to the Executive Vice-President of the Association by their respective deans.

Chapter VI.—Meetings

Section 2. Inaugural.—The inaugural meeting shall be held on Tuesday evening of the week of the annual meeting and shall be presided over by the President or in his absence or at his request by the Vice President, until the induction of his successor. The program for this meeting shall be *arranged by the Executive Vice-President of the* Association, subject to the approval of the Board of Trustees.

Division Three—Business and Legislation

Chapter IX.—House of Delegates

Section 1.

(B) Term.—(2) Secretaries of constituent associations, secretaries of sections of the Scientific Assembly, the Surgeons General of the United States Army, the United States Navy, *the United States Air Force and* the United States
ublic Health Service and the Chief Medical Director of the
dministration shall certify delegates and alternates
ıtive Vice-President of the American Medical

onment.—(1) The apportionment of delegates
tituent association shall be one delegate for
(1,000) or fraction thereof Active Members
n Medical Association as recorded in the
xecutive Vice-President of the American
ation on December 31 of each year. Such
shall take effect the ensuing January 1 and
ffective for one year thereafter. In January
the Executive Vice-President of the American
iation shall notify each constituent association
delegates to which it is entitled during the

n.—(2) A delegate or his alternate may
ıt credentials, provided he is properly identi-
egate or alternate selected by his association
ed to the Executive Vice-President of the
lical Association.

. Sessions.—(A) Regular.—The House of Dele-
meet annually on the Monday of the week of the
eeting and in the same city as the Scientific Assem-
he Association. The *House* of Delegates shall hold
terim session each year at the time and place desig-
by the Board of Trustees. Business that *may properly*
before an annual session may be considered at any
rim session subject to the provisions of the Constitution.
e provisions of the Bylaws governing the conduct of an
nnual session, shall apply to an interim session.

(B) Special.—Special sessions of the House of Delegates shall be called by the Speaker on written request of twenty-five or more delegates representing one-third or more of the constituent associations, or on request of a majority of the Board of Trustees. When a *special session is thus* called, the Executive Vice-President shall mail a notice to the last known address of each member of the House of Delegates at least twenty days before the special session is to be held. The notice shall specify the time and place *of meeting* and the purpose for which the session is called, and the session shall consider no business except that for which it was called.

Chapter XI.—Standing Committees (Councils) *of the* House of Delegates

Section 1. Designation and Administration.—The Judicial Council, the Council on Medical Education and Hospitals, the Council on Medical Service, and the Council on Constitution and Bylaws shall be the standing committees of the House of Delegates subject to the administrative direction of the Executive Vice-President.

Section 2. Membership.—(D) The Council on Constitution and Bylaws shall consist of five Active or Service Members elected by the House of Delegates for terms of five years, so arranged that at each annual session the term of one member expires. The President, Executive Vice-President, Assistant Executive Vice-President, a member of the Board of Trustees selected by the Board and the Speaker and Vice-Speaker of the House of Delegates shall be ex officio members of this Council without the right to vote.

Section 4. Officers.—The Councils and Committees shall organize and elect their own officers except that on nomination by the respective Councils, the Board of Trustees shall elect a secretary of the Council on Medical Education and Hospitals and a secretary of the Council on Medical Service and shall fix their salaries.

Section 9. Reports.—Each Council and Committee shall submit an annual report of its work to the House of Delegates at the interim session. All such reports, when possible, shall be transmitted to the Executive Vice-President of the Association before being presented at the interim session. The Executive Vice-President shall provide copies for distribution to the members of the House of Delegates and *arrange for their publication in* The Journal of the American Medical Association. Only urgent special reports shall be submitted at the annual session.

Chapter XII.—Reference Committees of the House of Delegates

Section 4. Enumeration.—The following reference committees are hereby provided:

(B) Board of Trustees, to which the reports of the Board of Trustees shall be referred;

Chapter XIV.—Nomination, Election, and Installation of General Officers and Affiliate and Honorary Members

Section 1. Nominations.—Nominations for office, except for Secretary-Treasurer, shall be made from the floor by a member of the House of Delegates. A nominating speech shall not exceed two minutes.

Section 2. Election of Officers.—(A) Time.—Officers of the Association, except the Secretary-Treasurer, shall be elected by the House on the fourth day of the annual session. The House may set the time or hour of such election by adopting an appropriate motion. The *Reference Committee on Rules* and Order of Business at each annual session shall consider this matter and *shall make recommendations* to the House.

Chapter XV.—Rights and Duties of Officers

Section 6. Secretary-Treasurer.—In addition to the rights and duties ordinarily devolving on the secretary of a corporation by law, custom or parliamentary usage and those granted or imposed in other provisions of the Constitution and these Bylaws, the Secretary-Treasurer shall (A) Be the *official* custodian of all securities and the income therefrom owned by the Association, subject to the direction and disposition of the Board of Trustees. The Board *may select* a bank or trust company to act as custodian in the place of the Secretary-Treasurer of all or any part of such securities and to act as agent of the Association in collecting the income therefrom. The Secretary-Treasurer shall give bond in such sum as may be fixed by the Board of Trustees, the premium on such bond to be paid by the Association.

(B) Perform such other duties as may be directed by the House of Delegates or by the Board of Trustees.

Chapter XVI.—Board of Trustees

Section 1. Composition.—The Board of Trustees shall consist of eleven members, nine elected as provided in Article VII of the Constitution, and the President and the President-Elect. The Vice President, Speaker and Vice Speaker of the House of Delegates shall attend all meetings of the Board (including executive sessions) with right of discussion but without the right to vote.

Section 4. Rights and Duties.—In addition to the rights and duties conferred or imposed on the Board elsewhere in the Constitution and Bylaws, the Board shall

(C) Appoint annually from one of its number a Secretary-Treasurer who shall assume his duties as a general officer as provided in Chapter XIV, Section 4, of the Bylaws.

(D) Appoint an editor or editors for all or any of the Association's publications. The Editor of The Journal of the American Medical Association shall be an ex officio member of all standing committees of the Board of Trustees and of the House of Delegates without the right to vote;

(E) Appoint an Executive Vice-President, who shall be the chief executive officer of the Association to manage and direct the activities of the Association. He shall be an ex officio member of all standing committees of the Board of Trustees and of the House of Delegates without the right to vote;

(F) Appoint an Assistant Executive Vice-President. He shall be an ex officio member of all standing committees of the Board of Trustees and of the House of Delegates without the right to vote;

(G) Have the accounts of the Association audited at least annually;

(H) Make proper financial reports concerning Association affairs to the House at its annual session, and

(I) In the event of a vacancy in any council or in any general office of the Association, except that of President or President-Elect or Speaker or Vice-Speaker, may fill the vacancy by appointment until the next annual session of the House, at which time the House shall elect for the unexpired portion of the term, unless otherwise provided for in the Constitution and these Bylaws.

Preliminary Report of Committee to Study A. M. A. Objectives and Basic Programs.—The progress report of the Committee to Study A. M. A. Objectives and Basic Programs was referred by the Speaker to the Reference Committee on Miscellaneous Business.

The committee, appointed by the Speaker pursuant to an action of the House at its 1957 Clinical Meeting, had been charged with the responsibility to consider four matters: (*a*) redefinition of the central concept of the A. M. A. objectives and basic programs; (*b*) placing more emphasis on scientific activities; (*c*) taking the lead in creating more cohesion among national medical societies; and (*d*) studying socioeconomic problems.

The committee met in Chicago on March 15, at which time a questionnaire was developed subject to necessary changes resulting from pretesting. Approximately 3,000 copies of the questionnaire, printed in black ink, together with a statement explaining the genesis of the committee, were mailed on May 14 to the officers, trustees, past-presidents, delegates, and alternate delegates of the A. M. A., the deans of medical schools, the members of A. M. A. councils, secretaries of American Boards, the officers and editors of state and county medical associations and of 133 other national medical organizations. Copies of the statement and questionnaire, printed in blue ink, were sent to a probability sample of 3,900 names drawn from the files of the A. M. A. Directory Department. The committee plans to make at least a tentative report to the House at its 1958 Clinical Meeting.

The Reference Committee urged those who had received a questionnaire to cooperate to the greatest degree possible, and recommended the adoption of the report.

Report of Committee to Study the Scientific Assembly.—The report of the Committee to Study the Scientific Assembly was referred by the Speaker to the Reference Committee on Amendments to the Constitution and Bylaws.

Pursuant to the action of the House at its 1957 Clinical Meeting, the Speaker appointed a committee to study the Bylaws as they pertain to the Scientific Assembly. (See Remarks of Speaker, page 53.)

The committee conferred with the Council on Constitution and Bylaws and its report coincides with the report submitted by the Council to the House of Delegates.

The Reference Committee considered together the report of the Committee to Study the Scientific Assembly and the special report of the Council on Constitution and Bylaws (See Report of Council on Constitution and Bylaws, page 59.)

Annual Meetings

On recommendation of the Board of Trustees, Miami Beach was selected as the site for the 1960 Annual Meeting of the Association and New York for the 1961 Annual Meeting.

No action was taken on the selection of a city for the 1962 Annual Meeting pending additional investigation of facilities offered by several cities.

Election of Officers

The following officers were elected:

President-Elect: Louis M. Orr, Orlando, Fla.
Vice-President: W. Linwood Ball, Richmond, Va.
Secretary-Treasurer: Raymond M. McKeown, Coos Bay, Ore.
Speaker, House of Delegates: E. Vincent Askey, Los Angeles
Vice-Speaker, House of Delegates: Norman A. Welch, Boston
Members, Board of Trustees: Warren W. Furey, Chicago; Raymond M. McKeown, Coos Bay, Ore., and Rufus B. Robins, Camden, Ark.
Member, Judicial Council: George A. Woodhouse, Pleasant Hill, Ohio
Members, Council on Medical Education and Hospitals: John Z. Bowers, Madison, Wis.; Leland S. McKittrick, Brookline, Mass.
Members, Council on Medical Service: John F. Burton, Oklahoma City, Okla.; Reuben B. Chrisman Jr., Coral Gables, Fla., and Russell B. Roth, Erie, Pa.
Members, Council on Constitution and Bylaws: W. C. Bornemeier, Chicago; William Hyland, Grand Rapids, Mich.; and William D. Stovall, Madison, Wis.

Election of Affiliate Members

The following persons were elected to Affiliate Membership in the American Medical Association:

American medical missionaries, nominated by the Judicial Council:

Donald T. Bosch, Hohokus, N. J.
Naomi L. Dalton, Vellore, South India
Donald R. Kindschi, Palo Alto, Calif.
Jay P. Munsey, Libya, North Africa
Samuel Gardner Rankin, Kowloon, Hong Kong
Leon K. Rittenhouse, Kingston, B. W. I.
David Paul Ruppert, Ethiopia, Africa
Raymond E. Stannard, U. S. O. M. Kathmandu, Nepal
Clifford S. Weare, Indianapolis, Ind.

Introduction of Resolutions.—The Speaker called for the introduction of resolutions:

Medicare: No. 1.—Dr. Milford O. Rouse for the Texas Medical Association introduced a resolution inviting the constituent medical societies to take action to terminate contracts on Medicare, and calling for the repeal, modification, or amendment of Public Law 569, 84th Congress, so as to provide medical care for the dependents of the personnel of uniformed services through programs underwritten by voluntary prepayment plans, or by pay increases adequate for such personnel to purchase voluntary prepaid insurance. It was requested that copies of this resolution be sent to the President of the United States, members of the Congress, and all constituent medical societies.

The Reference Committee on Legislation and Public Relations felt that as the present Medicare law contains a variety of methods of financing health care costs, the purpose of the resolution could be accomplished through modification of the present implementing directives without the necessity for new legislation. The committee recommended that the resolution be not approved and that the action taken by the House of Delegates at its 1957 New York meeting with respect to resolution 19, which reads in part as follows, be reaffirmed:

> "We . . . are recommending that the decision as to the type of contract and whether or not a fee schedule is included in future contract negotiations should be left to individual state determination . . ."

Medicare: No. 2 and 60.—Dr. Charles C. Smeltzer, Tennessee, introduced resolution 2 which protested the continuation by the Department of Defense of the fixed fee schedule, in those states whose doctors hold that this system is not satisfactory, and recommended (1) that the way should be opened by the Department of Defense for the negotiation of contracts under Medicare whereby physicians would be allowed to charge their usual and customary fee for the services rendered, and (2) that the A. M. A. Board of Trustees take all action possible to bring about these requested changes in the policy and administration of the Medicare program.

Resolution 60, introduced by Dr. J. W. Chambers, Georgia, resolved that the A. M. A. inform the Department of Defense immediately of the advantages of an indemnity-type Medicare contract, which would (1) reestablish the physician-patient relationship and eliminate the "complete third party medicine" aspects of the program; (2) decrease the vernment financial obligation to the patient and thereby minate the budgetary need for the restriction of freedom f choice of physician and eliminate the budgetary need for a decrease in the extent of authorized medical care; and (3) increase patient-doctor relationship and responsibility that is recognized by the American Medical Association as being so important in American medicine today, thereby restoring the status of the patient to that of other patients covered by indemnity-type plans comparable with industrial insurance plans. The resolution further recommended that the Association demand that the Department of Defense permit constituent medical societies to negotiate indemnity-type contracts at the earliest possible time.

The Reference Committee on Insurance and Medical Service, which considered these two resolutions together, felt that, since the A. M. A. is already on record as having requested the Department of Defense to permit individual states to negotiate an indemnity type (Medicare) contract, if so desired, and since the Association has a Task Force on Dependent Medical Care under the direction of the Board of Trustees, the committee recommended that these two resolutions be not adopted.

State-byState Participation in Federal Insurance Contribution Act: No. 3.—Dr. John N. Gallivan for the Connecticut State Medical Society introduced a resolution urging that the A. M. A. approve the principle of state-by-state physician participation under Title II of the Social Security Act, and further that the Association recommend to each constituent medical society the exploration of the feasibility of such participation.

The Reference Committee on Legislation and Public Relations after extensive discussion recommended that this resolution be not approved. In the opinion of the committee, the basic position of the A. M. A. in regard to Social Security is one of opposition to compulsory coverage of physicians. If the Association were to approve the inclusion of all physicians in a particular state, it would be approving the compulsory inclusion of many physicians in that state who are opposed to such coverage.

Indigent Care: No. 4.—Dr. Kenneth B. Castleton for the Utah State Medical Association introduced a resolution calling attention to the fact that confusion, duplication, and waste exist as a result of the multiplicity of programs in effect to provide matching funds to the various states for the medical care of welfare recipients, and making suggestions for their elimination.

The Reference Committee on Insurance and Medical Service was in general agreement with the intent of the resolution which recommended (1) that the A. M. A. bring this situation to the attention of the Congress with the view to complete revision of the program; (2) that the A. M. A. request that any funds provided under the Social Security program for the medical care of the indigent be directed toward the purchase of prepaid medical care, such as Blue Cross-Blue Shield, in order to eliminate the confusion, waste, and duplication and to provide better medical care for such senior citizens; and (3) that the resolution be forwarded to the Committee on Indigent Medical Care of the Council on Medical Service which is now conducting a study of this subject. The committee, however, recommended that section 2 be amended to read as follows: That the A. M. A. request that any funds provided under the Public Assistance provisions of the Social Security Act for medical care of the indigent be administered by a voluntary agency such as Blue Shield on a cost plus basis or by a specific agency established by the medical society of the state in which indigent care is rendered.

Free Choice of Physician: No. 5.—Dr. Robert C. Long for the Kentucky State Medical Association introduced a resolution recommending that the A. M. A. use its resources to develop at the earliest possible date an educational program designed to (1) educate the members of the medical profession to the advantages to the public and the profession of maintaining the free choice of physician system of practice, and (2) inform its members of the dangers to the public and the profession of participation in medical service plans that deny this system and that otherwise tend to lower the quality of medical care. Additionally, it was recommended that the A. M. A., working with the constituent medical societies and at the earliest date feasible, develop a continuing informational campaign designed to educate the public of the evils, dangers, and disadvantages of any medical service plan that tends to lower the quality and efficiency of the medical care it is now enjoying.

The Reference Committee on Insurance and Medical Service endorsed the intent of the resolution and, in particular, emphasized that freedom of choice of physician is basic in the philosophy of medicine. The committee therefore approved the resolution but recommended that its implementation be delayed until the Commission on Medical Care Plans reports at the 1958 Clinical Session. By way of an explanation the committee called attention to the stated purposes of the Commission on Medical Care Plans: To study (1) the nature and methods of operation of the various types of plans through which persons receive the services of physicians; (2) the effect of these plans on the quality and quantity of medical care provided; and (3) the legal and ethical status of the arrangements used by the various plans.

Opposition to Forand-Type of Legislation: No. 6 and 16.—Resolutions were introduced by Dr. Earl F. Leininger (No. 6) for the Nebraska State Medical Association and Dr. Milford O. Rouse (No. 16) for the Texas Medical Association relating to opposition by the A. M. A. to the Forand bill (H. R. 9467) and any legislation similar in philosophy and intent that would amend Title II of the Social Security Act by introducing a hospital and medical benefit, thereby establishing a national system of compulsory health insurance. The resolutions also requested that a copy of each be sent to the President, the members of the Congress, as well as to the constituent medical societies.

The Reference Committee on Legislation and Public Relations which considered the two resolutions together, recommended that they be approved with the exception of the resolve directing that they be sent to the President and others. The committee believed that publicity concerning the resolutions should be left to the discretion of those individuals within the Association charged with the responsibility of conducting the campaign against Forand-type legislation.

Voluntary Health Insurance for the Aged: No. 7.—Dr. C. C. Sherburne introduced a resolution for the Ohio State Medical Association calling attention to the rising cost of living which has made it difficult for the aged living on pensions or other fixed incomes to meet the costs of medical care, and recommending that the newly created Joint Council to Improve the Health Care of the Aged take immediate steps to confer with voluntary health insuring agencies and organizations on the feasibility of offering a contract which will provide (1) medical and hospital coverage for those beyond the age of 65, and (2) a method whereby the insured may secure paid-up coverage for life through the payment of necessary premiums prior to age 65.

The Reference Committee on Insurance and Medical Service was in general agreement with the intent of the resolution. It approved section 1 of the resolution, but was of the opinion that the second section may not now be considered feasible. The committee called attention to the 1957 Clinical Meeting report of the Reference Committee on Insurance and Medical Service which urged a continuation of studies along these lines. The committee was also of the opinion that it is inappropriate to refer resolutions from this House directly to an interassociation group, such as the Joint Council to Improve the Health Care of the Aged. With these comments in mind, the committee recommended the adoption of the resolution with the suggestion that it be referred to the Board of Trustees for proper implementation.

Automatic Stop Order on Dangerous Drugs: No. 8.—Dr. James M. Kolb, Arkansas, introduced a resolution urging that the A. M. A. express strong opposition to the action of the Joint Commission on Accreditation of Hospitals in advocating an automatic stop order on dangerous drugs, because (1) the dangerous drugs were not defined; (2) it is extremely difficult to have stop orders on some types of medication and not on all medication; (3) since the order has been in effect (December 1957) there have been many instances of patients needlessly suffering; (4) physicians capable of ordering drugs are capable of stopping those same drugs; and (5) the order is an arbitrary and unnecessary invasion of the doctor-patient relationship. Copies of the resolution were to be sent to the Joint Commission on Accreditation of Hospitals, the American College of Physicians, the American College of Surgeons, the American Hospital Association, the Canadian Medical Association, and the American Academy of General Practice.

In the report of the Reference Committee on Medical Education and Hospitals, it was pointed out that the regulation was established because of some unfortunate situations affecting the health and life of individuals where automatic stop orders did not exist. While recognizing that any regulation or order is only as effective as those administering it may make it, and that unfortunate situations may arise involving strict interpretation by some, the committee was of the opinion that this regulation is good from the standpoint of the protection of the public. The committee further believed that the proper administration of such a regulation in order to be satisfactory to everyone concerned involves responsibility for its administration on the part of individuals and hospitals in a particular area, and therefore recommended that the resolution be disapproved.

Social Security Coverage for Physicians: No. 9.—Dr. Stanley B. Weld for the Connecticut State Medical Society introduced a resolution instructing the Secretary of the Association to conduct a nationwide referendum on the question of Social Security coverage for physicians, and that the results be reported as soon as possible to the secretaries of the constituent medical societies.

The Reference Committee on Legislation and Public Relations pointed out that as there is no provision in the Constitution and Bylaws of the Association for a referendum of its members, such a referendum would usurp the duties and prerogatives of the House. The committee therefore recommended that the resolution be not approved. (See also discussion on resolutions 19 and 20, page 66.)

Senior Medical Students as Clinical Clerks to Replace First Year Interns: No. 10.—Dr. Philip H. Jones for the Louisiana State Medical Society introduced a resolution calling attention to the fact that nonuniversity affiliated hospitals are experiencing great difficulty in obtaining interns in the numbers and of the caliber they require, and further that many of these hospitals have the facilities for providing excellent intern training programs.

The Reference Committee on Medical Education and Hospitals approved the intent of the resolution that the A. M. A. take appropriate measures to investigate the feasibility of the use of senior medical students in clinical clerkships in the place of first year interns in university affiliated hospitals. It recommended that the resolution be referred to the Council on Medical Education and Hospitals for its information.

Restrictive Effect of Board Certification on Practice of Medicine: No. 11.—Dr. Philip H. Jones for the Louisiana State Medical Society introduced a resolution stating that when board certification groups were first organized they were meant to improve standards and clarify competence of individuals as practitioners in various specialties, but that the act of certification has become stereotyped and is being used restrictively "as a union card" in the practice of medicine in many instances. The resolution requested that the A. M. A. request its representatives on the Joint Commission on Accreditation of Hospitals to exercise their influence to direct that Board certification should not be used as a qualification for staff appointments in hospitals approved by the Commission.

The Reference Committee on Medical Education and Hospitals called attention to the fact that the sentiment expressed by the resolution is one which has been reiterated by the Joint Commission on Accreditation of Hospitals on a number of occasions. The committee recommended approval of the resolution with the following modification: "That the House of Delegates of the A. M. A. request its representatives on the Joint Commission on Accreditation of Hospitals to exercise their influence to direct that Board certification not be used as the sole qualification for staff appointments in hospitals approved by the Commission."

Medicare: No. 12.—Dr. James M. Kolb, Arkansas, introduced a resolution recommending that the A. M. A. request the administrator of the Medicare program to issue a directive to the negotiating team to submit to the wishes of those states in which it is customary to start charging night rates at 7 p. m.

The Reference Committee on Insurance and Medical Service did not believe it was possible to set up a national policy as requested in the resolution and believed that the matter should be left to the decision of the individual states in negotiating their Medicare contracts. The committee therefore recommended that the resolution be not adopted.

The House, however, adopted an amendment made on the floor to the effect that the A. M. A. request the administrator of the Medicare program to issue a directive to the negotiating team to submit to the wishes of each state in all matters in the Medicare program.

Limitation of Exemption for Residents from Payment of Dues: No. 14.—Dr. O. J. Campbell, Minnesota, introduced a resolution requesting an amendment to eliminate the time limitation from the present provisions of Chapter III, Section 4, of the Bylaws of the Association, limiting the exemption for residents from payment of dues to the period of five years following graduation. It was felt that the exemption should be available to members entering residencies and fellowships later than five years after graduation.

The Reference Committee on Amendments to the Constitution and Bylaws agreed with the intent of the resolution except for its reference to fellowships. It was pointed out that fellowships are not now covered by Chapter III, Section 4 (C), of the Bylaws. The committee recommended that the resolution be referred to the Council on Constitution and Bylaws for implementation insofar as it relates to residents, and to residents only.

Relationships Between Medical Profession and Administrators of Medical Care Plan of UMWA: No. 15.—A resolution was introduced by the Tennessee delegation requesting that a special committee composed of three or five members of the House of Delegates be appointed by the Speaker of the House (*a*) to make an investigation of the situation in the states where disputes exist between the medical profession and the administrators of the medical program of the UMWA for the purpose of determining the facts with regard to the origin and the nature of such disputes, (*b*) to report their findings to the House of Delegates at its 1958 Clinical Meeting, and (*c*) that the Board of Trustees make available to the committee the necessary funds and personnel for its proper functioning.

The Reference Committee on Insurance and Medical Service commended the medical profession in Tennessee for the manner in which it has approached problems of medical care in the coal mining areas and for its successful liaison with administrators of the medical program of the UMWA. However, it was of the unanimous opinion that the appointment of a special committee is not now necessary; that a great deal of work has been and is being done by various groups within the Association; and that the creation of a new committee would be a duplication of work and money. The committee further pointed out it is hoped that the Commission on Medical Care Plans will report at the 1958 Clinical Meeting on some of the suggestions made in this resolution. The committee recommended, that in view of the activities already being carried out by the A. M. A., the resolution be not approved.

Inclusion of Physicians Under Social Security: No. 17.—Dr. Milford O. Rouse for the Texas Medical Association introduced a preamble and resolutions requesting that the Association unequivocally oppose the inclusion of self-employed physicians in the Social Security System, and that a copy of the resolution be sent to the President of the United States, the members of the Congress, and the constituent medical societies.

The Reference Committee on Legislation and Public Relations was in favor of the principle expressed by the resolution but recommended the adoption of the following substitute resolution:

WHEREAS, Proposals for the inclusion of self-employed physicians in the Social Security System have been made repeatedly and are now pending before Congress; and

WHEREAS, The matter has been discussed several times before the A. M. A. House of Delegates and its reference committees, yet there remains the necessity of reiterating our position to members of Congress and to the general public that American physicians still strongly oppose being included in the Social Security System; and

WHEREAS, American physicians always have stood on the principle of security through personal initiative; therefore be it

Resolved, That the House of Delegates of the American Medical Association unequivocally opposes the compulsory inclusion of self-employed physicians in the Social Security System.

Jenkins-Keogh Bills: No. 18.—Dr. Milford O. Rouse for the Texas Medical Association introduced a resolution requesting that the A. M. A. again affirm its strong endorsement of the principle of the Jenkins-Keogh plans, urging the prompt and favorable consideration of the proper bills in the present Congress, and that a copy of the resolution be sent to the President of the United States, the members of the Congress, and the constituent medical societies.

The Reference Committee on Legislation and Public Relations recommended approval of this resolution.

Social Security Coverage for Physicians: No. 19 and 20.—Resolutions relating to a poll of the A. M. A. membership regarding the inclusion of physicians in the Social Security System were introduced by Dr. P. J. DiNatale for the Medical Society of the State of New York (No. 19 and 20).

Resolution 19 resolved that a mail poll of the entire membership be undertaken immediately by the Board of Trustees on the question, "Do you favor (yes or no) inclusion of self-employed doctors of medicine in the Federal Social Security System on a compulsory basis?"; that the poll not include any reference to the Jenkins-Keogh bills or coverage on a voluntary basis, but be confined to the latter question, and that the results of the poll be published in THE JOURNAL and reported to the House of Delegates at its 1958 Clinical Meeting.

Resolution 20 resolved that the Secretary of the Association conduct a poll of active members in an attempt to ascertain their feelings for or against compulsory Social Security for physicians.

The Reference Committee on Legislation and Public Relations after lengthy discussion felt that the members of the House of Delegates are sufficiently well informed to represent adequately the views of the physicians of America on this question. It was pointed out that the House of Delegates is the policy-making body of the Association and a poll therefore would be informational only. The committee was of the opinion that any poll should be taken on a state-by-state basis, and the results transmitted to the A. M. A. delegates from each state. The committee accordingly recommended that resolutions 19 and 20 be not approved.

Social Security for Physicians: No. 21 and 22.—Dr. P. J. DiNatale for the Medical Society of the State of New York introduced resolutions (No. 21 and 22) relating to Social Security benefits for self-employed physicians.

Resolution 21 resolved that the A. M. A. call on the Congress of the United States to extend benefits of social security to self-employed physicians, and that the Board of

Trustees take appropriate action in order that there may be federal legislation in support of this policy.

Resolution 22 asked that the Association rescind its 1957 action in not choosing to advocate social security for doctors of medicine under the federal law, and instead affirm approval thereof.

The Reference Committee on Legislation and Public Relations recommended that these resolutions be not approved.

Old Age and Survivors Insurance Program: No. 23.–Dr. P. J. DiNatale for the Medical Society of the State of New York introduced a resolution requesting that the A. M. A. advocate that the schedule of allowances by the Bureau of Disability Determinations be not lower than that adopted for the fee schedule of allowances under the Medicare program in the various states, and that a copy of this resolution be sent to each constituent medical society.

The Reference Committee on Insurance and Medical Service was in agreement with the intent of this resolution and recommended its adoption.

Artificial Respiration for Rescue Work: No. 25.–Dr. James Greenough for the Medical Society of the State of New York introduced a resolution urging that the Association officially adopt and endorse the expired air method of artificial respiration for rescue work.

The Reference Committee on Hygiene, Public Health, and Industrial Health heard testimony presented by qualified experts from the Section on Anesthesiology and others, convinced that the expired air method of artificial respiration is an effective and now possibly the best known method of resuscitation. After due deliberation, however, the committee questioned the advisability of official endorsement of specific techniques by the American Medical Association. It felt that should this practice become common, the meetings of the House might be over-burdened with the consideration of innumerable techniques in all fields of medicine and surgery. It also feared the possible adoption or rejection of such techniques by the A. M. A. without due and careful consideration, and that general acceptance of a procedure by the medical profession might even be delayed while waiting for formal approval. Solely for these reasons of policy, the committee recommended that this resolution be not approved.

The House of Delegates, however, adopted a motion made on the floor that the report of the Reference Committee be amended to indicate that no action be taken on this resolution.

Two-Year Rotating Internship: No. 26.–Dr. Thomas d'Angelo for the Medical Society of the State of New York introduced a resolution urging that medical schools adopt the policy of encouraging a reasonable percentage of graduates to seek rotating internships in accredited municipal and community hospitals, and that a copy of the resolution be sent to the dean of each medical school in the United States.

The Reference Committee on Medical Education and Hospitals recommended that the resolution be referred to the Council on Medical Education and Hospitals for study and necessary action because of the continuing study it is carrying on with respect to the internship.

Shortage of Interns: No. 27.–Dr. William B. Rawls for the Medical Society of the State of New York introduced a resolution requesting that (1) the A. M. A. recommend the two-year rotating internship; (2) the specialty boards give credit for the second year; (3) the armed services be requested to delay their induction until the completion of intern training, whether one or two years, and (4) a copy of the resolution be sent to appropriate agencies.

The Reference Committee on Medical Education and Hospitals recommended that the resolution be referred to the Council on Medical Education and Hospitals for study and necessary action. (See also discussion on resolution 26, this page.)

Operating Room Mortality: No. 28.–Dr. R. J. Azzari for the Medical Society of the State of New York introduced a resolution requesting the Council on Medical Education and Hospitals to develop a classification of, and terminology for, operating room deaths to be promulgated to the constituent and component medical societies, to help in assembling data at those levels. The resolution pointed out that operating room mortality appears to be an increasing hazard in the conduct of surgical practice, and that the lack of definition of the terminology of cardiac arrest and the lack of uniformity in the compilation of operating room mortality statistics does not permit accurate assay of the problem or comparison of these mortality statistics from different areas.

The Reference Committee on Medical Education and Hospitals felt that because of the seriousness of the problem the resolution should be referred to the Board of Trustees with the recommendation that an *ad hoc* committee be appointed to study the entire matter.

Service-Connected Disabilities in Veterans Administration Hospitals: No. 30.–Dr. Durward G. Hall for the Missouri State Medical Association introduced a resolution requesting (1) that the A. M. A. urge congressional action to restrict hospitalization of veterans at VA hospitals to those with service-connected disabilities, and (2) that the organized medical profession of the United States offer to provide the VA with competent attending and consultant staffs of a quality acceptable to dean's committees, provided admissions to VA hospitals are so restricted.

The Reference Committee on Legislation and Public Relations approved a substitute resolution which included item (1) above and recommended that the A. M. A. suggest to the dean's committees that they restrict their activities to VA hospitals admitting only patients with service-connected disabilities.

A. M. A. Mediation Committee: No. 31.–Dr. Eustace A. Allen of the Medical Association of Georgia introduced a resolution requesting that the Board of Trustees be authorized to consider the establishment of a permanent mediation committee to be set up jointly by the A. M. A. and the Association of American Medical Colleges, the committee to be available, when requested by the local medical organization and the medical school concerned, for the purpose of mediating difficulties which have arisen concerning ethics and other matters involving the practice of medicine.

The Reference Committee on Miscellaneous Business recalled that at the 1956 Annual Meeting the relationship between local medical organizations and medical schools involving the practice of medicine was considered, and suggestions were formulated to be followed in considering ethical relationships between these groups. The House at that time recommended that "on request of the medical society or a medical school, the A. M. A. Board of Trustees establish in cooperation with the Association of American Medical Colleges a special committee whose function would be to investigate areas where there is friction between the medical school and the profession. Such a committee might (1) assure the continuation of liaison; (2) see to it that all data and facts are made available to all concerned, and (3) seek to resolve differences of opinion." Recently, a committee of this type was selected to settle problems involving medical organizations and a medical school in Georgia. The committee performed an excellent service and the problems were resolved satisfactorily.

The Reference Committee believed that in view of the excellent results obtained by previous action of the House there is no advantage in the formation of a permanent committee; that there appears to be a lack of information among medical organizations as to the existence of this plan for the selection of such committees; and that wider publicity should be given to these mediation committees. The committee recommended that the resolution be not adopted.

Relation of Physicians and Hospitals: No. 32.—Drs. Warren W. Furey and W. C. Bornemeier for the *Illinois State* Medical Society introduced a resolution requesting that a study be made to determine whether or not the growing practice by hospitals of encouraging staff members to conduct their private office practice within or adjacent to the hospital is a major move toward the practice of medicine by hospitals.

The **Reference Committee on Insurance and Medical Service** believed that a study should be made and recommended approval of the resolution with the further recommendation that it be referred to the Board of Trustees for prompt implementation.

Care of the Aged: No. 33.—Dr. William Weston Jr., South Carolina, introduced a resolution requesting the A. M. A. to urge the Congress to refrain from the passage of laws which would hamper the efforts of the newly created Joint Council to Improve the Health Care of the Aged by making the aged of our population more dependent on the federal government, so that this organization may have reasonable time to work out the solution of the problem in the traditional American way, and recommending that a copy of the resolution be forwarded to members of the Congress with a request that they use their best efforts to implement the purpose expressed therein.

The **Reference Committee on Legislation and Public Relations** recommended that the resolution be approved and referred to the Board of Trustees for appropriate action. (See also discussion resolution 7, page 65.)

A. M. A. and Other National Medical Associations: No. 34.—Dr. George D. Johnson, *South Carolina, introduced a resolution* requesting that the Board of Trustees explore the desirability and feasibility of having the House of Delegates meet with some of the larger associations such as the American Academy *of General Practice*, the Southern Medical Association, and other organizations at their fall meetings.

The **Reference Committee on Miscellaneous Business** agreed in spirit with the resolution, but felt that meetings between members of these organizations are already occurring and consequently recommended that the resolution be not adopted.

Accreditation of Hospitals: No. 35.—Resolution No. 35 introduced by Dr. Malcom E. Phelps, Oklahoma, requested) that the A. M. A. be urged *to assume promptly* its true *ponsibility by establishing* a plan for accreditation of ospitals, such plan to be limited to the problems of patient care, staff organization, and intern and resident training programs, and (2) that the American Hospital Association be urged to cooperate with the A. M. A. by limiting its accreditation activities to the strictly physical problems of hospital care which *unquestionably is its responsibility.*

The **Reference Committee on Medical Education and Hospitals** called attention to the fact that pursuant to action of the House at its 1955 Annual Meeting, a special committee was appointed to review the functions of the Joint Commission on the Accreditation of Hospitals, and that its report was made *to the House of Delegates* in June 1956. The *reference committee* also called attention to Section F of the report of that committee which states in subsection I: "After thorough study the Committee does not believe administrative and professional functions in accreditation can be separated, but believes *accreditation of the hospital* should be done by the *Joint Commission* and accreditation of *internship and residency* programs should continue to be the *function* of the American Medical Association through its Council on Medical Education and Hospitals."

Because the report of the special committee was accepted by the House, *the reference* committee recommended that the resolution be not adopted.

Advertising of Proprietary Drugs: No. 37.—Resolution 37 introduced by Dr. Philip S. Foisie, *Massachusetts*, stated *that inasmuch* as extensive promotion, *particularly* by television and radio, of self-medication for common symptoms such *as indigestion*, constipation, and anemia may postpone *the diagnosis* of serious disease, (1) that the A. M. A. record *its opposition* to this dangerous and rapidly growing practice, and (2) that the question be referred to the Board of Trustees for consideration and appropriate action.

The Reference Committee on Hygiene, Public Health, and Industrial Health indicating it was cognizant of the excellent work being voluntarily carried out by organizations *concerned* with advertising, recommended the adoption of the following amended resolution:

WHEREAS, Extensive *advertising and promotion* through newspapers, magazines, television and radio of self-medication for common symptoms such as indigestion, constipation, and anemia may postpone the diagnosis of serious illness; therefore be it

Resolved, That the American Medical Association record *its opposition to this dangerous* practice, and that the question be referred to the Board of Trustees for consideration and appropriate action.

Operating Room Training of Student Nurses: No. 38—Resolution 38 introduced by Dr. William F. Costello, New Jersey, called *attention to* the developing tendency in the United States to reduce the operating room experience required in the curriculum for student nurses, and requested that the A. M. A. express its disapproval and stern opposition to curtailment or withdrawal of this experience as incompatible with the rounded development of those professional capabilities desirable and *indispensable for the public welfare.*

The Reference Committee on Medical Education **and Hospitals** recommended the adoption of a substitute resolution that recommended that the A. M. A. express the opinion that some operating room experience is valuable and necessary training for all nurses.

Hospital Accreditation: **No. 39 and 56.**—Resolution 39 introduced by Dr. Philip H. Jones, Louisiana, indicated that the standards and requirements maintained by the Joint Commission on Accreditation of Hospitals are such that they can best be maintained by the larger and teaching hospitals. It suggested that the A. M. A. *ask its representatives on the Joint Commission* to attempt to make a distinction between the requirements for teaching hospitals and the smaller hospitals, with less teaching facilities, residents, and interns.

Resolution 56 introduced by Dr. Walter C. Bornemeier, Illinois, resolved that the A. M. A. instruct its representatives on the Joint Commission on Accreditation of Hospitals to defend and enhance the role of the physician and county medical societies in medical matters in their own community, and recommended that county medical societies be consulted whenever possible in matters of accreditation.

The **Reference Committee on Medical Education and Hospitals** reviewed these resolutions together and recommended that they not be adopted. *By way of explanation*, it was pointed out that *in the "Report of the Committee to* Review the Functions of the Joint Commission on Accreditation of Hospitals (Stover Committee, 1956) it was recommended that the Commission give consideration to establishing standards which may vary depending upon the size of the hospital. Each hospital should be judged on its own merits and efficiency, regardless of size." It was further pointed out by members of the Joint Commission that some changes had been made *in the Commission's regulations pertaining to the organizational structure* for small hospitals and that continued study was being given to this problem. The committee was cognizant of the fact that there can be only one standard of medical care regardless of size of the hospital. It was felt that the successful experience in Ohio where a state medical society Committee on Accreditation was established for the purpose of determination and solution of problems, as a result of meetings with representatives of the Joint Commission, might well set a pattern for similar programs in other areas where misunderstandings exist due to certain regulations of the Joint Commission.

Proposed Regionalization Program in Commonwealth of Puerto Rico: No. 40.—Resolution 40 introduced by Dr. C. L. Berio, Puerto Rico, indicated that attempts are being made to organize in the Commonwealth of Puerto Rico a system of medical care known as the Regionalization Program which is in essence the socialization of medicine. The resolution requested that (1) the A. M. A. oppose vigorously such a Regionalization Program in Puerto Rico, unless it be clearly and explicitly shown that such a program will deal with the reorganization and integration of the government facilities for the care of the indigent population only, without any attempt whatsoever to establish a global, socialized system of government medicine; (2) the Rockefeller Foundation be requested to withdraw financial and technical support for such a program unless its objectives are clearly redefined and publicly stated along the lines set forth above, and (3) a copy of this resolution be sent to the appropriate agencies.

The Reference Committee on Miscellaneous Business felt that the regionalization plan represented an experiment initiated by government to control the practice of medicine and will result, in effect, in the socialization of medicine in Puerto Rico. The committee was wholeheartedly in favor of the resolution and recommended that it be adopted.

Medical Journal Advertising: No. 42.—Dr. Donald A. Charnock for the California Medical Association introduced a resolution to the effect that advertising in medical journals must adequately and properly reflect for the benefit of physician readers the true substance, use, therapeutic advantages, and necessary precautions in using the product advertised, and advertising safeguards should be maintained.

The Reference Committee on Miscellaneous Business was in agreement with the principle of the resolution, but recommended the adoption of amendments requesting that the Board of Trustees continue its leadership in maintaining proper advertising safeguards in its own publications, and that appropriate A. M. A. councils assist constituent state and component county medical societies to the end that physicians reading the publications of these societies may be confident that all advertising printed in these journals has passed a fair but rigid examination by competent authorities.

A. M. A. Washington Office: No. 43.—A resolution was introduced by Dr. Frank A. MacDonald, California, requesting that the Board of Trustees (1) immediately survey and reevaluate the functions and effectiveness of its Washington Office in the light of present-day needs of the government, public and medical profession alike for effective liaison between government and medicine on all matters affecting the public's health, and adequate, prompt and accurate transmittal to the A. M. A. membership of information on all current public issues in which the physician has a direct interest, and (2) implement, as rapidly as possible, all changes and additions that its survey discloses are desirable to achieve the basic purpose of the resolution; namely, effective public and government relations.

The Reference Committee on Reports of Board of Trustees and Secretary after long and serious consideration, agreed that there is a need for reevaluation of the over-all legislative program of the A. M. A.; that changes in the regional set-up of the Committee on Legislation may be necessary; and that a re-definition of the respective duties of the Washington Office and the Chicago headquarters is indicated. The consensus expressed at the committee hearing was that there is a need for a broad and integrated program; that more strengthening of efforts is required; and that there must necessarily be complete cooperation and understanding between the Washington Office and the headquarters office of the Association.

The committee recommended approval of the resolution, with an amendment to section (1) to indicate that the survey and the reevaluation include not only the Washington Office but the over-all A. M. A. legislative system.

Basic Medical Rights of American Citizens: No. 44.—A resolution was introduced by Dr. Donald A. Charnock, California, calling attention to the fact that in the social trend toward organized programs for the purpose of obtaining protection against the unexpected costs of illness, various agencies now act as third parties for the purpose of organizing and managing such programs, thus interposing themselves between physicians and patients, and urging approval of several principles.

The Reference Committee on Insurance and Medical Service, while attempting to keep within the intent of the resolution, recommended the adoption of a substitute resolution that the House of Delegates approve the following principles:

"We, as physicians, cognizant that the American citizen enjoys certain basic rights as his heritage, and that these rights extend to the citizen in his position as a patient, do hereby recognize these basic medical rights:

"1. He should have the right to employ the physician of his choice and should be free to terminate the professional relationship at will, without bureaucratic or governmental domination; and

"2. He should have the right to know that his physician is responsible for all decisions regarding the extent of his medical care, and that these decisions are not dictated, restricted, or controlled by any third party."

The committee further recommended that the Board of Trustees and its representatives publicize these principles as the basis for participation in any program of medical care.

Tax Deduction for Tuition Costs of Higher Education: No. 45.—A resolution was introduced by Dr. Donald A. Charnock, California, requesting that the A. M. A. legislative committee and the members of the Congress be urged to take steps to initiate, or to have introduced into the Congress, legislation which would have as its object the allowance of all items incurred in the maintenance of a student in a recognized college or university for tuition or fees as deductible items in the computation of gross income for federal income tax purposes.

The Reference Committee on Legislation and Public Relations, although in sympathy with the sentiments expressed in the resolution, recommended that it be referred to the Committee on Legislation for study along with the numerous other income tax bills now before that Committee.

Nurse Training Program: No. 46.—Dr. Donald A. Charnock, California, introduced a resolution requesting the A. M. A. to initiate continuing discussions with representatives of the American Nurses Association, the National League of Nursing, the American Hospital Association, and all other interested groups, to resolve the inadequacies in quality and quantity of nurse training, and to disseminate the results of such discussion to the medical profession through available media.

The Reference Committee on Medical Education and Hospitals recommended the adoption of a substitute resolution to the effect that the A. M. A. initiate continuing discussions with the groups as listed, to improve the quality and quantity of nurse training.

Indigent Care: No. 47.—Dr. Donald A. Charnock, California, introduced a resolution to the effect that recent acts of the U. S. Congress and several state legislatures have brought on an initial form of government-controlled medicine which is bureaucratic, arbitrary, and subject to governmental whim and mismanagement, is contrary to the best interests of the health of the elderly people of this nation. The resolution requested (1) that the Board of Trustees set up a specially designated committee to study, anticipate, educate, and, in the very best interests of the people, prepare for similar legislation that will surely be presented in the not-too-distant future to our state lawmakers; and (2) that the committee be empowdered to engage the services of public relations experts and any others whose special aptitudes and qualifications might make their services of value; and (3) that the House authorize this committee, subject to approval by the Board of Trustees, to spend any reasonable sums to further this public relations and legislative program.

The Reference Committee on Legislation and Public Relations approved the resolution in principle and recommended referral to the Board of Trustees for study and implementation.

Special Division of the A. M. A.: No. 48.—Dr. Donald A. Charnock, California, introduced a resolution pointing out that there continues to be increasing third party intervention, governmental and otherwise, between physician and patient to the detriment of good medical practice, and recommending that an entirely new special division of the A. M. A. be established and staffed with skilled, highly trained individuals. The functions of this division would be (*a*) to plan and execute a long-range program of preserving the present system of medical practice and the rights of the individual physician to practice medicine in the manner of his choice; (*b*) to formulate further plans to meet the medical needs of the American people under the voluntary free enterprise system; and (*c*) to offer positive advice and assistance to state and local societies as to courses of action to follow as specific threats to voluntary medical care arise in their areas.

The Reference Committee on Miscellaneous Business agreed wholeheartedly with the principle of the resolution to establish a long-range planning group. However, inasmuch as there are two committees at the present time working in this general field, the committee was unable to decide whether or not the long-range objectives of the resolution were being carried out by these two committees. It suggested therefore an amendment requesting the Board of Trustees to explore the desirability of establishing an entirely new special division of the American Medical Association with functions as outlined above.

Radiation Hazard: No. 49.—Dr. Donald A. Charnock, California, introduced a resolution requesting the Board of Trustees to set up an appropriate committee or commission of experts to (1) investigate radiation hazard from all sources; (2) evaluate the statements that are currently being made; and (3) report their findings with all possible dispatch to the A. M. A. and to the American people.

The Reference Committee on Hygiene, Public Health, and Industrial Health was in agreement with the desirability of establishing of a committee or commission of experts to consider the problem of radiation hazards from all sources. It noted, however, that such a committee, to be known as the Committee on Atomic Medicine and Ionizing Radiation, had been proposed by the Board of Trustees. (See THE JOURNAL, May 17, pages 343-345, and action of reference committee, page 56.) The committee therefore felt that the adoption of this resolution was unnecessary, and it recommended that no action be taken.

Guide for Judgment of Third Party Plans: No. 50.—Dr. B. E. Montgomery, Illinois, introduced a resolution outlining a guide, based on "The Principles of Medical Ethics and Opinions and Reports of the Judicial Council," June 7, 1958, to serve as a standard of what is unethical conduct in the association of a physician with a third party plan.

The Reference Committee on Insurance and Medical Service believed it would be unwise to act hastily on any statement of medical ethics, and therefore recommended that the resolution be referred to the Judicial Council.

Korean Children: No. 51.—Dr. E. G. Chuinard, Oregon, introduced a resolution requesting that the A. M. A. (1) declare its grave concern over the health of Korean children, the adoptive families and communities in which they will live, resulting from the admission into the United States under Section 6, Public Law 85-316, of Korean children suspected of or known to be infected with severe communicable diseases, including pulmonary tuberculosis, and (2) petition the Congress to amend this Section of the law so as to control, in the interest of the public health and welfare, the admission of children with severe communicable diseases into the United States.

The Reference Committee on Legislation and Public Relations felt that the American people should be highly commended for opening their homes to Korean orphans and for adopting these children. It hoped that the individuals who have undertaken the task of transporting the unfortunate children to their new homes will be able to continue their wonderful work. The committee was in favor of the resolution and urged its approval.

Freedom of Choice: No. 52.—Dr. Wilkie D. Hoover, Oklahoma, introduced a resolution indicating that the A. M. A. should not accept any system of [illegible] practice of medicine which does not [illegible] principles:

1. Freedom by the patient to consult the physician of his choice;
2. Freedom by the physician to choose those whom he will serve;
3. Freedom by the physician to practice his calling in accordance with the recognized code of medical ethics;
4. Freedom by the physician to care for his patients in accordance with established scientific principles, not subject to interference by a third party;
5. Freedom by the physician to practice his profession on a fee-for-service basis;
6. Freedom by the physician to collect directly from the patient a portion of the fee for each service performed;
7. Freedom by the physician to practice such a system of government-sponsored practice of medicine under terms of a written contract between the government and the various state medical associations, such contract to be of limited duration and renewable by mutual agreement of the contracting parties; and
8. Freedom by the state medical associations to have professional representation at the policy-determining level of such a proposed system.

The Reference Committee on Insurance and Medical Service concurred in a number of the principles set forth in the resolution, but because the subject matter is being considered by the Commission on Medical Care Plans, it felt that no action should be taken until the House received the report of the Commission. It therefore recommended that the resolution be not adopted.

Attendance of Immediate Past-President at Meetings of Board of Trustees: No. 53.—Dr. James P. Hammond, Vermont, introduced a resolution stating that the President of the A. M. A. has, by virtue of the attainment of that office, demonstrated his outstanding ability and qualifications as a physician and medical statesman, and recommending that the Bylaws be amended to effect the inclusion of the immediate Past-President at meetings of the Board of Trustees.

The Reference Committee on Amendments to the Constitution and Bylaws agreed that the knowledge and ability of the immediate Past-President should be utilized by the Association. It was of the opinion, however, that this end is accomplished by Chapter XI, Section 2(C) of the Bylaws, which makes the immediate Past-President an ex officio member of the Council on Medical Service. The committee therefore recommended that the resolution be not approved.

Licensure by Reciprocity: No. 54.—A resolution introduced by Dr. Walter C. Bornemeier, Illinois, urged that the A. M. A. stimulate suitable legislation on a national level so that physicians and surgeons, licensed by examination in Illinois, qualify for licensure in all states which recognize the principles of reciprocity.

The Reference Committee on Medical Education and Hospitals recommended the adoption of a substitute resolution that the Board of Trustees be directed to take appropriate steps for the consummation of a study of the problem pertaining to licensure by reciprocity, and that it consult with the Federation of State Medical Boards in an attempt to find a satisfactory solution to this problem.

Compulsory Assessments and Audits by Hospitals: No. 55.—Dr. Walter C. Bornemeier, Illinois, introduced a resolution condemning the practice of individual hospitals who have continued (1) to make compulsory assessments of members of the medical staff for building funds, and (2) to require audits of staff members' financial records as a requisite for continued staff appointments.

The Reference Committee on Medical Education and Hospitals stated that the resolution reaffirms a position taken previously by the A. M. A. and recommended its approval.

Federal Food and Drug Administration: No. 57.—Dr. Wendell C. Stover, Indiana, introduced a resolution commending the Federal Food and Drug Administration for its untiring efforts in behalf of the public and the profession and for the meritorious service it has performed in protecting the public from objectionable and harmful practices in the production and sale of foods, drugs, medical devices, and cosmetics. The resolution also pledged the fullest cooperation of the A. M. A. in furthering the intent and purposes of the Federal Food and Drug Law, and recommended to all states that they review their state food and drug laws with the intent of strengthening their own laws in such a way as to offer maximum protection to the public and assistance to the Federal Food and Drug Administration.

The Reference Committee on Hygiene, Public Health, and Industrial Health agreed with the resolution and recommended its adoption.

Voluntary Health Agencies: No. 58, 59, and 61.—Resolutions relating to the voluntary health agencies were introduced by Dr. Samuel J. McClendon, California (No. 58), Dr. F. M. Forster, Section on Nervous and Mental Diseases (No. 59), and the Alabama Delegation (No. 61).

The Reference Committee on Hygiene, Public Health, and Industrial Health recommended the adoption of a substitute resolution requesting the Board of Trustees to arrange a top-level conference with the voluntary health agencies, the United Fund, the American Medical Research Foundation, and other parties interested in the raising of funds for health causes, with the view of resolving difficulties that have arisen since the development of the concept of united community effort.

The House of Delegates, after much discussion on the floor, adopted the following statement as a substitute for the Reference Committee report:

(1) That the House of Delegates reiterate its commendation and approval of the principle of voluntary health agencies.

(2) That it is the firm belief of the American Medical Association that these agencies should be free to conduct their own programs of research, public and professional education, and fund raising in their particular spheres of interest.

(3) That the House of Delegates respectfully requests that the American Medical Research Foundation take no action which would endanger the constructive activities of the national voluntary health agencies.

(4) That the Board of Trustees continue actively in studies of these perplexing problems, looking forward to their ultimate solution.

Use of Official Stamp: No. 62.—Dr. William Weston Jr., South Carolina, introduced a resolution requesting the A. M. A. headquarters office to use the South Carolina official stamp on A. M. A. membership cards of bona fide members of the South Carolina Medical Association, who would be members in good standing at the time of the acknowledgment of their membership in the A. M. A.

The Reference Committee on Reports of Board of Trustees and Secretary recommended that the resolution be referred to the Executive Vice-President without comment, for such action as is deemed feasible and advisable.

Use of Alphabet by A. M. A. Councils and Committees: No. 62A.—Dr. Harry Arnold Jr. introduced a resolution for the Alaska, Hawaii, Puerto Rico, and Isthmian Canal Zone delegations requesting that the House of Delegates remind the A. M. A. councils and committees that an alphabetical sequence is to be followed in listing the constituent medical societies in tabulations and reports.

The House of Delegates unanimously adopted this resolution.

Extension of Draft Act: No. 63.—Dr. Donovan F. Ward for the Iowa delegation introduced a resolution relating to the absence of a provision in the present act for an equitable call-up of physicians to support a rapid expansion in the event of an emergency.

The Reference Committee on Legislation and Public Relations recommended the adoption of a substitute resolution instructing the Board of Trustees through the appropriate councils and committees of the Association to effect a liaison with the Department of Defense for the purpose of effecting a more equitable call-up of physicians in time of a national emergency.

Consultation with Interested Sections in Special Publications of A. M. A.: No. 64.—Dr. H. Relton McCarroll for the Section on Orthopedic Surgery introduced a resolution requesting that a revision be made of the "Guide to the Evaluation of Permanent Impairment," and that such revision, together with all future A. M. A. publications which touch on the interests of individual Sections, be made with the cooperation of the interested Section or Sections through the appointment by them of committees whose function shall be to assist in the guidance and editing of such publications.

The Reference Committee on Hygiene, Public Health, and Industrial Health, after lengthy discussion and careful consideration of the resolution, recommended that the problems presented by this resolution can be most successfully resolved by referral of it to the Board of Trustees.

Psychiatric Patients in General Hospitals: No. 65.—Dr. F. M. Forster, Section on Nervous and Mental Diseases, introduced a resolution requesting the A. M. A. representatives on the Joint Commission on Accreditation of Hospitals to call to the attention of the Commission the recommendation that general hospitals, wherever feasible, be encouraged to permit the hospitalization of suitable psychiatric patients.

The Reference Committee on Medical Education and Hospitals was in accord with the resolution and recommended its implementation.

MEDICINE AND THE LAW

On June 25, during the annual meeting in San Francisco, the film entitled "The Man Who Didn't Walk" had its première showing. This film is the third in a series of medicolegal films which is being sponsored by the Wm. S. Merrell Company in cooperation with the American Medical Association and the American Bar Association. The brief speeches preceding the showing of the film are presented below.

THE MAN WHO DIDN'T WALK

Introductory Comments by Dr. Hugh H. Hussey on Behalf of the American Medical Association

It is indeed a pleasure for me, as a representative of the Board of Trustees of the American Medical Association, to present a few brief remarks concerning this important medicolegal film. It concerns traumatic neurosis—one of the most controversial subjects in personal injury litigation and workmen's compensation cases. Mr. Bronson will tell you about the legal intricacies involved, so I will allude only to some of the medical aspects of the problem.

For the benefit of the nonmedical members of the audience, a trauma is anything, either physical or mental, that causes injury to the individual. Although we usually think of trauma as a physical force, such as a blow, there are other forms of trauma—thermal trauma, for example, a burn or frostbite; chemical trauma, contact of acid with the skin; and psychic trauma.

In general, a neurosis can be likened to an emotional or a mental turmoil that induces greater than normal attention to bodily manifestation of illness or greater than normal response to injury.

The combination of words into the term "traumatic neurosis" first occurred about 100 years ago. It was used to designate causes in which neither gross organic lesions nor true psychoneurotic mechanisms could be demonstrated. As used today, the term has many meanings. However, the condition it is intended most often to describe is chiefly the result of conflicting forces or drives within the personality structure of the individual, a reaction not specifically related to the type of injury that caused it.

Persons with genuine traumatic neuroses, for the most part, are those who have previously been apparently well adjusted and who, after an injury—sometimes a relatively mild or even trifling injury—manifest a set of symptoms that involve all aspects of their psychic living. The violence and nature of the accident or trauma merely color the intensity of the neurosis rather than determine its essential character.

It is easy to see, therefore, why an attorney who has a case involving this issue is dependent on the physician for an impartial evaluation of the matter. It is also easy to see why the physician who is called upon to determine the existence of the neurosis and its possible relationship to the trauma has an extremely difficult task.

It is, in fact, the nature of the condition that has led to malingering and to charges of malingering. Many believe that too frequently claims-conscious people purposely feign illness and try to reproduce nonexistent signs and symptoms in order to deceive, to evade responsibility, or to derive gain. Others believe that unalloyed malingering does not exist, that simulation in these cases is always a symptom of some underlying psychic disturbance, while still others apply the term to practically all compensation cases in which organic damage cannot be demonstrated.

When a court or commission is asked to find that a traumatic neurosis does or does not exist, it must have the best possible evidence before it. The obligation of attorneys and physicians is increased by virtue of the very nature of the condition encompassed within the meaning of the term "traumatic neuroses." Neither court nor commission nor the administration of justice will be well served unless both physician and lawyer ethically collaborate to obtain and present the best evidence.

Obviously, the attorney wants and must have the cooperation of the physician with respect to the identification of traumatic neurosis and proof of its existence or nonexistence in any given case. The physician, in keeping with the scientific disciplines of his profession, wants to and must cooperate with the attorney so that the knowledge of medical science can be properly applied in the forum of justice.

In addition to my personal relations with members of the legal profession, I have had the good fortune to be a representative on the American Medical Association–American Bar Association Liaison Committee. That committee has as its basic objective the improvement of doctor-lawyer relationships. Today, the House of Delegates approved a national interprofessional code prepared by the committee. That code will also be submitted to the A. B. A.'s House of Delegates this summer for consideration and, I hope, adoption.

This film, the other films in the Medicine and the Law series, and the codes of interprofessional conduct are manifestations of the sincere efforts to improve the administration of justice. With patience and with continued collaboration between the two professions, our interprofessional problems should eventually be substantially eliminated.

On behalf of the American Medical Association—all thanks to the Wm. S. Merrell Company for underwriting the cost of these films. The company's foresight and generosity have been a great aid in improving medicolegal relations.

It remains, however, for each of us personally to apply the principles we have learned or agreed to so that the individual we serve—whether he be patient or client—is benefited by our mutual cooperation to protect his inalienable rights.

Comments by E. D. Bronson, Esq., on Behalf of the American Bar Association

It is a pleasure to extend to the American Medical Association greetings of the American Bar Association. Mr. Charles Rhyne of Washington, D. C., has asked me to express his disappointment in being unable personally to appear and, as president of the association, to extend his greetings and good wishes. As his proxy I am honored indeed on behalf of the members of the A. B. A., if not for all of the lawyers in this country, to salute you and to solicit your friendly and patient understanding of the problems of the legal profession where they parallel or cross the interests of the doctors and also to assure you of our constant endeavor to work with you toward understanding and toward solution of those problems.

The subject that was assigned is the cooperation between doctors and lawyers with special reference to traumatic neurosis. The film that you are about to see is a vivid portrayal of the problem that lies at the core of these cases. For a number of years I have represented the corporate insurers of these risks in the trial courts. Their attorneys undoubtedly look with a more jaundiced eye than you upon these claims of traumatic neurosis. So it is easy to make the confession that I am left today in much the same degree of doubt and uncertainty about the reliability of this diagnosis as with the first case that came to my attention, and frequently it would appear that the doctors suffer the same uncertainty, whether expressed or not.

What we are talking about now is the case where the traumatic neurosis is claimed in court, coupled with demands for heavy money damages for a radical and permanent condition. We are not talking about the case where litigation is not involved. Apparently all of the students of the subject have agreed that the addition of the profit motive, with or without the compulsive aspects, adds a grave and illusive factor, sometimes referred to as "compensation neurosis."

The lawyer is prone to use examples from his own experience. One case that dramatically presented the diagnostic problem was a trial here in San Francisco about 1934 or 1935. A lady was in an automobile accident and claimed that total bilateral blindness resulted. As she sat in the witness chair staring with sightless eyes she made a truly shocking picture. Her own doctor, a respected and highly competent eye specialist, Dr. McCool, testified identically with the eye specialist that we called, the late Dr. Hans Barkan, the head of that department at the University of Stanford Hospital. They found, first, that there was nothing in the manner of the automobile accident or the physical injury suffered to account for any damage to sight. Second, there was nothing found in the eyes or the nerve tracts, and, finally, they both concluded that it was a true case of hysterical blindness.

In the midst of the trial we procured for the defense a neurological examination by Dr. Howard Naffziger of the University of California Hospital. He testified that in the course of an hour or two of examination three incidents occurred in the lady's movements and the use of her hands that were completely inconsistent with blindness. One incident could be coincidence, but not three. She did have vision.

Traumatic neurosis is said to be the most common manifestation of hysteria, and serious error is inevitable unless the diagnosis is established by most careful study.

All texts speak of frequent coincidence of hysteria and malingering—sometimes impossible to separate. One text states: "The borderline between deliberate exaggeration and unconscious hysteria is often invisible to both patient and doctor." Another says: "Doctors are one of the greatest causative factors leading to traumatic neurosis . . . instillation of doubt or fear in patient's mind with limited data or insufficient time and study—dangerous."

Doctors can be sympathetic but need not mollycoddle the weakling patient. In litigated cases, I argue for the critical approach—whether you examine for an insurance company or are treating your "pet" patient.

Suppose the patient is a self-centered, ingrown type, antagonistic, with a sense of inferiority or burdened with economic problems or an intolerable family life—a typical pattern for development of a neurosis. Soon the patient goes from petulant complaints to honestly fooling himself.

On the other hand, the patient may be smart, well-trained, emotionally balanced, but with claims of persistent ills, into and past the convalescent stage. That, it seems, is a different picture, especially where a damage claim is pending.

In any of these cases, it seems to me that doctors should not accept everything as true merely because the patient says he has an ache, a pain, a spasm, a tremor, or an area of anesthesia. A careful and extended study is indicated. Differential procedures should be used and tests made for malingering so that a true analysis and conclusion is reached.

That, gentlemen, is an area for cooperation between us.

MEDICAL NEWS

ARKANSAS

Grant for Training of Researchers.—The pathology department at the University of Arkansas School of Medicine, Little Rock, has received a grant of $107,200 from the National Institutes of Health, to be used over the next five years on research projects directed by Dr. Hans G. Schlumberger, head of the department. Dr. Schlumberger said the grant money will be used to augment training of research personnel. The grant became effective July 1 and totals $32,000 for the first year. Thereafter, it will be $18,800 annually for four years.

CALIFORNIA

Ground Broken for Memorial Research Laboratory.—Ground-breaking ceremonies were held July 23 for the Bruce Lyon Memorial Research Laboratory at Children's Hospital of the East Bay in Oakland. The laboratory, scheduled to be completed by Dec. 31, will cover about 8,000 square feet and will be built on a portion of the present hospital parking lot. The L-shaped building will cost about $262,000 and will house 25 rooms for various research purposes. Mr. and Mrs. Harvey B. Lyon and their sons, Dr. Richards P. Lyon and Dr. Harvey B. Lyon Jr., gave $100,000 to establish the laboratory in memory of their son and brother, Bruce, who was killed in World War II. A grant of $75,000 was made in November, 1957, by the National Institutes of Health of the Department of Health, Education and Welfare. Dr. Irvine McQuarrie is director of research at the hospital.

KANSAS

Symposium on Infectious Diseases.—The second annual Symposium on Infectious Diseases, jointly sponsored by the American Academy of General Practice, Kansas University Medical Center, and Lederle Laboratories, will be held Sept. 19, at Battenfeld Auditorium on the medical center campus, Kansas City, Kan. The program will open with a 90-minute discussion of staphylococcal infections. Dr. Robert I. Wise, associate professor of medicine at Jefferson Medical College, Philadelphia, will discuss "Modern Methods of Diagnosis." Dr. William M. M. Kirby, professor of medicine at the University of Washington, Seattle, will present "New Concepts in Epidemiology." Dr. Harry F. Dowling, head, department of internal medicine, University of Illinois, Chicago, will discuss the "Control and Treatment" of staphylococcal infections. The three speakers will meet for a one-hour panel discussion moderated by Dr. Robert W. Weber, University of Kansas. At the evening session the following three speakers are scheduled: Dr. Richard Cannon Eley, assistant clinical professor of pediatrics in the Children's Hospital at Harvard, Boston, presenting "The Role of Steroids in Contagious Diseases"; Dr. Thomas G. Ward, associate director of Lobund Institute at the University of Notre Dame, "A Review of the New Respiratory Vaccines"; Dr. Thomas H. Haight, assistant professor of medicine, preventive medicine and public health, University of Oklahoma School of Medicine, Oklahoma City, "Diagnosis and Control of Acute Glomeruloneephritis." After the symposium a reception will be held at the Hotel Muehlebach. For information write the American Academy of General Practice, Volker Boulevard at Brookside, Kansas City 12, Mo.

LOUISIANA

Graduate Medical Assembly in Lake Charles.—The 12th annual meeting of the Southwest Louisiana Graduate Medical Assembly will be held at the Majestic Hotel in Lake Charles Sept. 12-13. Speakers will include Drs. William A. Sodeman, Philadelphia; Howard R. Mahorner, Isadore Dyer, Rudolph J. Muelling, and Richard E. L. Fowler, New Orleans; and Thomas H. Blake, James D. Hardy, and John R. Snavely, Jackson, Miss. Dr. David Buttross Jr., 1620 Foster St., Lake Charles, La., is the assembly director. The assembly has the approval of the American Academy of General Practice for postgraduate credits.

MICHIGAN

State Medical Meeting in Detroit.—The 93rd annual session of the Michigan State Medical Society will be held Sept. 30-Oct. 3 at the Sheraton-Cadillac Hotel, Detroit. The president's annual address will be given during the "officers night" proceedings by Dr. George W. Slagle, Battle Creek. Two panel discussions, "Ulcerative Colitis and Ileitis in Children" and "Malabsorption Syndrome and Diarrhea," will be moderated by Drs. James L. Wilson, Ann Arbor, and David J. Sandweiss, Detroit, respectively. The Andrew P. Biddle Lecture, "Functional Disorders of the Digestive Tract," will be given by Dr. Henry L. Bockus, Philadelphia. Papers at the general sessions include the following by Canadian participants:

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

The Infected Surgical Wound, Dr. Robert C. Harrison, Edmonton, Alberta.
Ocular Aids in Diagnosis of Metabolic Disease, Dr. Alfred J. Elliot, Toronto, Ontario.
Tympanoplasty, Dr. Joseph A. Sullivan, Toronto.

Scientific exhibits are planned, and the "State Society Night" will be held Oct. 2, 9:30 p. m. For information write Dr. L. Fernald Foster, 606 Townsend St., P. O. Box 539, Lansing, Mich., Secretary.

MONTANA

Annual State Meeting in Billings.—The 80th annual meeting of the Montana State Medical Association will be held Sept. 11-13 at the Shrine Auditorium, Billings. A panel discussion, "A New Look at Alcoholism" will be moderated by William G. Walter, Ph.D., professor of bacteriology, Montana State College, Bozeman. The program includes the following guest speakers: Drs. Ross T. McIntire and Herbert E. Schmitz, Chicago; Arnold S. Jackson, Madison, Wis.; Evan L. Frederickson, Seattle; Harold E. Harris, Cleveland; Claude F. Dixon, Rochester, Minn.; Frederick W. Hoffbauer and Joseph Jorgens, Minneapolis; and Cyril B. Courville, Los Angeles. Dr. John A. Layne, Great Falls, president of the association will present an address the afternoon of Sept. 11. At the annual banquet (7:30 p.m. Sept. 11) Dr. F. J. L. Blasingame, Executive Vice-President, American Medical Association, will present "Reorganization for Service." Technical and educational exhibits and a ladies' program are arranged, and a motion picture, "Hypothyroidism," is scheduled for the morning of Sept. 12. For information write Dr. Theodore R. Vye, Secretary-Treasurer, Montana Medical Association, 412 N. Broadway, Billings.

NEW JERSEY

Death from Tetanus Reported.—The first death from tetanus in a human being in New Jersey in 1958 was reported from Newark recently. The victim was a 22-year old woman who fell and cut her knee on a broken bottle. Six days later, rigidity of the jaw developed and a few days later she died.

Personal.—The Board of Directors of Merck & Co., Inc., has elected Dr. Karl H. Beyer Jr. and Robert G. Denkewalter, Ph.D., as administrative vice-presidents of the Merck Sharp & Dohme Research Laboratories. In the newly created vice-presidential posts, Drs. Beyer and Denkewalter will share over-all administrative responsibility for the organization's research programs.——Dr. Herbert L. Goodman, formerly assistant pathologist at the Bryn Mawr Hospital, Bryn Mawr, Pa., has been appointed pathologist and director of the laboratory at the East Orange General Hospital.

NORTH CAROLINA

Grant for Program of Development.—The Rockefeller Foundation has granted $250,000 to the department of medicine, University of North Carolina School of Medicine, Chapel Hill, for a five-year program of general development. Dr. Charles H. Burnett, chairman of the department, will direct the program, which will be concluded in 1963 and which will consist of three main parts: (1) further development of the general medical clinic in conjunction with the department of preventive medicine; (2) closer liaison and teaching with the basic medical sciences; (3) development of a foreign student exchange program, especially graduate medical students from the South American countries.

Personal.—Dr. Lenox D. Baker, Durham, Duke University orthopedic surgeon and president of the North Carolina Medical Society, has been appointed to the Medical Committee of President Eisenhower's Committee on Employment of the Physically Handicapped.——Dr. Charles H. Burnett, head, department of medicine, University of North Carolina School of Medicine, has been appointed to serve through Sept. 30, 1962, on the National Advisory Arthritis and Metabolic Diseases Council.——Dr. Keith S. Grimson, professor of surgery at the Duke University Medical Center, Durham, was honored by the University of North Dakota Alumni Association June 7, when he received an Alumni Association Distinguished Service Citation. Earlier this year, Dr. Grimson received a 1958 Modern Medicine Distinguished Achievement award from the journal *Modern Medicine.*

OHIO

Dr. Selye to Lecture in Cincinnati.—Dr. Hans Selye, director, Institute of Experimental Medicine and Surgery, University of Montreal, will speak on "The Future of Medicinal Chemistry" at the dedication of The William S. Merrell Company's new Medicinal Chemistry Laboratories, Cincinnati, Sept. 11. An academic lecture has been arranged also by Merrell and the University of Cincinnati College of Medicine. Dr. Selye will lecture on "The Chemical Prevention of Cardiac Necroses" at the Mont Reid Pavilion, Cincinnati General Hospital, 8:00 p. m., Sept. 10.

OKLAHOMA

Colloquy on Advances in Medicine.—The second Oklahoma Colloquy on Advances in Medicine will be held Nov. 12-15 at the University of Oklahoma School of Medicine, Oklahoma City. It will be devoted to "Arthritis and Related Disorders" and is under the joint sponsorship of the department of medicine, University of Oklahoma, the Division of Postgraduate Education; Geigy Pharmaceuticals; Wyeth Laboratories; The Upjohn Company; Pfizer Laboratories; and Schering Corporation. Twelve investigators will participate and present the results of original work from their laboratories. Among the guest speakers will be: Drs. Alfred Jay Bollet, Detroit; Richard H. Follis Jr., Washington, D. C.; Robert A. Good, Minneapolis; Alexander B. Gutman, New York City; Ralph Heimer, Ph.D., New York City; Charles H. Slocumb, Rochester, Minn.; John H. Talbott, Buffalo, N. Y.; and Morris Ziff, New York City. Registration will be open to all physicians. Information may be obtained from the Division of Postgraduate Education, University of Oklahoma School of Medicine, Oklahoma City, Okla.

TEXAS

General Practice Meeting in San Antonio.—The Texas Academy of General Practice will hold its ninth annual assembly Sept. 21-24 in the Gunter Hotel, San Antonio. A symposium on abdominal pain will include the following:

Abdominal Pain in Children, Dr. Sydney S. Gellis, Boston.
Causes of Abdominal Pain, Dr. Sherman M. Mellinkoff, Los Angeles.
Gastro-Duodenal Ulceration, Dr. Alton Ochsner, New Orleans.

Other participants include Drs. Franklin G. Ebaugh, Denver; Homer B. Field, Blue Island, Ill.; Milton Helpern, New York City; Willis E. Brown, Little Rock, Ark.; John D. Porterfield, Washington, D. C.; and Philip Thorek, Chicago. Mr. Philip R. Overton will present "Legal Problems Confronting Physicians in Everyday Practice" the morning of Sept. 22. For information write the Texas Academy of General Practice, 1905 Lamar, Austin 5, Texas.

VIRGINIA

Dr. Woodward Commended for Safety Crusade.—Dr. Fletcher D. Woodward, of Charlottesville, for many years chairman of a department at the University of Virginia medical school, has been awarded the Allstate Safety Crusade Certificate of Commendation for his leadership in traffic safety. This certificate is given by the Allstate Insurance Companies to carefully selected individuals and groups for outstanding accident prevention efforts. The presentation was made recently in Washington, D. C., during a meeting of the Surgeon General's (Public Health Service) Accident Prevention Advisory Committee, of which Dr. Woodward is a member. Dr. Woodward has been crusading for highway safety since 1948 and since 1935 he has been chairman of the American Medical Association's Committee on Medical Aspects of Automobile Injuries and Deaths. This committee has already published a booklet of advice to the driver and is preparing another book intended as a guide to the physician in determining a person's fitness to drive.

WASHINGTON

Annual State Meeting in Spokane.—The 69th annual convention of the Washington State Medical Association will be held at the Davenport Hotel, Spokane, Sept. 14-17. Five refresher courses will be conducted simultaneously the mornings of Sept. 16 and 17. Scientific films will be shown the morning of Sept. 15. The general scientific sessions include the following papers by out-of-state speakers:

Changing Concepts in the Treatment of Polyps of the Colon and Rectum, Dr. Walter A. Fansler, Minneapolis.
Osteomyelitis—Diagnosis, Treatment and Complications, Dr. Robert A. Murray, Temple, Texas.
Radiographic Signs of Mongoloidism During Early Infancy, Dr. John P. Caffey, New York City.
Aneurysm of the Aorta, Dr. William S. Middleton, Washington, D. C.
Remote Pain as an Aid in the Diagnosis of Abdominal Disease, Dr. Lucian A. Smith, Rochester, Minn.
Renal Artery Disease in Hypertension, Dr. Eugene F. Poutasse, Cleveland.

Scientific and technical exhibits are planned. For information write Dr. Frederick A. Tucker, Secretary-Treasurer, Washington State Medical Association, 1309 Seventh Ave., Seattle 1.

WEST VIRGINIA

Symposium on Gastroenterology in Huntington.—Sponsored by the Cabell County Medical Society, a symposium on gastroenterology will be held Sept. 11 at the Hotel Prichard, Huntington. Panel discussions with guest moderators are planned as follows:

Gastrointestinal Bleeding, Dr. Seymour J. Gray, Harvard University, Boston.
Jaundice, Dr. William B. Bean, University of Iowa, Iowa City.
Chronic Diarrhea, Dr. William G. Sauer, Mayo Clinic, Rochester, Minn.

Other guest participants include Dr. Philip J. Hodes, University of Pennsylvania, Philadelphia, and Dr. Stanley O. Hoerr, Cleveland Clinic, Cleveland. Exhibits are planned, and at the conclusion of the dinner hour a question-and-answer period will be conducted by Dr. Bean. For information write Dr. Rowland H. Burns, 1109 Sixth Ave., Huntington, W. Va.

Name Assistant Dean.—Dr. Clark K. Sleeth, of Morgantown, a member of the teaching staff of West Virginia University School of Medicine for the past 23 years, has been named assistant dean of the school and will assist Dean Edward J. Van Liere in executing policies established by the faculty. Dr. Sleeth will continue as an associate professor of Medicine and will serve as a physician at the University Health Service.

WISCONSIN

Conference on Athletic Injuries.—A Conference on Athletic Injuries will be held in Milwaukee Nov. 7. High school coaches and administrators, athletic officials, physical education instructors, and physicians are invited. The faculty includes Dr. Stephen E. Reid, of Evanston, Ill., team physician for Northwestern University athletic teams, and Drs. Donald W. McCormick, Fond du Lac; Edgar S. Gordon, W. D. Stovall and Frank D. Bernard, Madison; Lloyd M. Simonson, Sheboygan; Francis J. Millen, Milwaukee, and Robert Krohn, of Black River Falls. Six hours of category II credit will be given for attendance to American Academy of General Practice members. Sponsor of the conference in the State Medical Society's Charitable, Educational and Scientific Foundation, cooperating with the Wisconsin State High School Coaches' Association, the W. I. A. A., State Board of Health, Wisconsin Academy of General Practice, State Department of Public Instruction, Wisconsin Orthopedic Society, the Wisconsin Heart Association, and the medical society's Division on School Health. There will be no charge to registrants. For information write the State Medical Society of Wisconsin, 330 E. Lakeside St., Madison 5, Wis.

GENERAL

Nation's Oldest Essay Contest.—The trustees of America's oldest medical essay competition, the Caleb Fiske Prize of the Rhode Island Medical Society, announce as the subject for this year's dissertation "Bronchogenic Carcinoma—Predisposing Causes." The dissertation must be typewritten, double spaced, and should not exceed 10,000 words. A cash prize of $300 is offered. Essays must be submitted by Dec. 31. For information write to the Secretary, Caleb Fiske Fund, Rhode Island Medical Society, 106 Francis St., Providence 3, R. I.

Seminar Cruise to the West Indies.—Ohio State University will sponsor a West Indies–South America seminar cruise, sailing from Wilmington, N. C., Nov. 11 aboard the M/S Stockholm. The 15-day cruise will include visits to Havana, San Blas Islands, Cristobal, Curacao, La Guaira, St. Thomas, and San Juan. Over 30 topics are included in the proposed medical program, and the seminar constitutes 30 hours acceptable category I postgraduate requirements of the American Academy of General Practice. Dr. Noel P. Hudson, assistant dean of postgraduate medical education, is the program chairman. For information write the Ohio State University College of Medicine, Postgraduate Education, Columbus, Ohio.

Fracture Association Meeting.—The 19th annual meeting of the American Fracture Association will be held Sept. 30-Oct. 2 at the Hotel Skirvin, Oklahoma City, Okla. The meeting will be accepted for category II credit by the American Academy of General Practice, and the preceding postgraduate course, Sept. 29, is acceptable for category I. Twenty-five papers are scheduled on the regular program. Round-table discussions, scheduled for noon, Sept. 30, will include the following moderators: Drs. Duncan C. McKeever, Houston, Texas, president of the association; Charles M. Swindler, Ogden, Utah; Harold J. Meier, Coldwater, Mich.; J. Otto Lottes, St. Louis; and Walter T. Henderson, Richlands, Va. Exhibits and discussion periods are planned. A "Chuck-Wagon Dinner" will be held at "Frontier City," Sept. 30. For information write Dr. Hermann W. Wellmerling, 610 Griesheim Building, Bloomington, Ill.

Decline in Number of Marriages.—About 1,420,000 marriages will be performed in the United States this year, the statisticians of the Metropolitan Life Insurance Company estimate. In the first quarter of 1958 marriages were 11.5% fewer than in the corresponding period of 1957; if the trend continues, 1958 will record the smallest number of marriages in about two decades, the statisticians report. The slump in marriages began in the last four months of 1957. Up through August of last year, marriages in the U. S. totaled only 1% below the number in the like period of the year before. Since August, marriages in every region of the country have been substantially fewer than in the comparable months of 1956. Only eight states recorded more marriages in the year 1957 than in 1956. Moderate increases were reported in Oklahoma, Utah, Indiana, Florida, and West Virginia. The largest gains, somewhat over 5%, occurred in Colorado, Nevada, and California.

Announce Awards for Research in Aging.—The Ciba Foundation, London, England, has announced that a panel has considered 62 papers from 19 countries for the Ciba Foundation's awards for 1958 for research relevant to the problems of aging, and the following awards have been made (the names of leading authors only are given) to U. S. authors:

Dr. Robert J. Boucek, Miami, for "The effect of tissue age and sex upon the metabolism of rat collagen," £300.

Laurence O. Pilgeram, Ph.D., Minneapolis, for "Deficiencies in the lipoprotein lipase system in atherosclerosis," £200.

Harry Sobel, Ph.D., Los Angeles, for "(a) Urinary steroids and the hexosamine-collagen ratio of dermal punches; (b) The influence of age upon the hexosamine collagen ration of dermal biopsies from men; (c) Lean-body-mass creatinine-coefficient deficit and urinary steroids," £200.

The awards are being offered for a fifth and final time in 1959, the closing date for entries being Jan. 10, 1959, and information may be obtained from the Ciba Foundation, 41 Portland Place, London, W. 1, England.

Fellowship for Study of Nutrition.—A research fellowship of one million francs is awarded every year by the French Nestlé Company to a physician who wishes to specialize in the field of nutrition. For the year 1958-1959 the panel of judges awarded the fellowship to Dr. André Frederich, Lyons. The 1959-1960 fellowship will be awarded in the spring 1959. Applicants are requested to send to the International Children's Centre, Chateau de Longchamp, Bois de Boulogne, Paris XVI°: (a) a curriculum vitae setting forth their work on the biological and social problems connected with feeding or nutrition of infants and children; (b) an introduction letter from one of their Masters; (c) a description of the studies they wish to pursue. Applicants must have a sufficient command of the French language. At the end of the fellowship period, the fellow will be expected to send to the International Children's Centre a scientific study on the subject which they will have studied during the year.

Society News.—The officers of the **American Proctologic Society** for the year 1958-1959 are: president, Dr. Karl Zimmerman, Pittsburgh; president-elect, Dr. Hyrum R. Reichmann, Salt Lake City; vice-president, Dr. Patrick H. Hanley, New Orleans; secretary, Dr. Norman D. Nigro, Detroit; and treasurer, Dr. Robert J. Rowe, Dallas, Texas.——The officers of the **American Laryngological Association** for 1958-1959 are: president, Dr. Fred W. Dixon, Cleveland; secretary, Dr. James H. Maxwell, Ann Arbor, Mich.; treasurer, Dr. Francis E. LeJeune, New Orleans; and editor, historian, and librarian, Dr. Edwin N. Broyles, Baltimore. The 80th annual meeting of the association will be held at The Homestead, Hot Springs, Va., March 8-9, 1959.——The **American Electroencephalographic Society** has elected the following officers: president, Dr. Wladimir T. Liberson, Rocky Hill, Conn.; president-elect, Dr. Arthur A. Ward Jr., Seattle; treasurer, Dr. Isadore S. Zfass, Richmond, Va.; and secretary, Dr. Jerome K. Merlis, University Hospital, Baltimore 1.

Announce Donner Fellowship Winners.—The National Academy of Sciences–National Research Council has announced the selection of nine scientists in the U. S. and Canada to be awarded the Donner Fellowship for medical research for the coming academic year. The fellowships were initiated in 1957 through the financial support and interest of the Donner Foundation of Philadelphia, established in 1932 in memory of Joseph Donner by his father, the late William H. Donner, president of Donner Steel Company, of Buffalo, until its sale to Republic Steel Corporation in 1929. Until 1949, the foundation's charitable activities were devoted exclusively against cancer. Since 1949 the foundation has channeled a majority of its funds to three fields: awards to recognized medical groups or institutions for research on the causes of and therapy for the less-understood illnesses and diseases, support for secondary education, and support of projects designed to preserve "our American way of life."

Grants for Research in Nutrition.—Twenty medical and nutritional scientists have been awarded nearly $215,000 in grants-in-aid to continue or start new projects for study in the relationship between nutrition and human health, raising to $5,000,000 the amount distributed among universities and medical schools throughout the U. S., Canada, and Central America by the Nutrition Foundation since its founding 17 years ago. The foundation, organized by food and related manufacturers in December, 1941, has as its basic purpose "the development of a comprehensive program of fundamental research, providing basic information in the science of nutrition; and the support of educational measures that will assist in making the science of nutrition effective in the lives of present and future generations." The four largest grants-in-aid awarded were:

Johns Hopkins University—Drs. David A. Turner and Albert I. Mendeloff to study the fate of dietary fats in animal and human nutrition; $28,000.

University of Toronto—Dr. Charles H. Best to study the lipotropic factors: Choline, betaine, methionins, and inositol; $20,000.

Harvard University—Konrad E. Bloch, Ph.D., to study biological synthesis of unsaturated fatty acids; $15,000.

Washington University—Dr. Carl F. Cori to study the Mechanism of carbohydrate reactions in animal tissue; $14,000.

Meeting of Medical Writers.—The 15th annual meeting of the American Medical Writers' Association will be held at the Hotel Morrison, Chicago, Sept. 26, to be followed by a workshop on medical writing, Sept. 27. Speakers include Drs. John Z. Bowers, Madison, Wis., editor, *Journal of Medical Education*; Charles E. Lyght, Rahway, N. J., director, medical publications, Merck, Sharp & Dohme Research Laboratories; Alton Ochsner, New Orleans, professor of surgery, Tulane University; Austin Smith, Chicago, editor of THE JOURNAL; Karl A. Menninger, Topeka, Kan., chief of staff, Menninger Foundation. The workshop Sept. 27 will be directed by Dr. Jacques P. Gray, visiting lecturer on medical writing of the AMWA assisted by Lois DeBakey, B.A., of Tulane University; Selma DeBakey, B.A., of the Alton Ochsner Medical Foundation; Mildred H. Lysle, M.S., of the Cleveland Clinic Foundation; and Dr. Richard H. Orr, San Francisco, director, Institute for Advancement of Medical Communications. The meeting is open to all persons interested in any phase of medical communications. There is no registration fee for the Sept. 26 meeting; there is a $5 registration fee for the workshop on Sept. 27 for nonmembers. For information write Dr. Harold Swanberg, Secretary, W. C. U. Bldg., Quincy, Ill.

Information Service for Southeast Physicians.—An information service, for physicians in North Carolina, South Carolina, and Virginia, is being launched which will feature a monthly booklet, entitled "What Goes On," which will list all medical meetings, special lectures, postgraduate courses and other events of interest in the three-state area. Distribution will be free to practicing physicians and medical faculty members. Dr. William M. Nicholson, director of postgraduate medical education at the Duke University Medical Center, Durham, N. C., said the booklet will be prepared by the center, in cooperation with medical societies and schools in all three states. Financial sponsorship will come from the Lederle Laboratories Division of the American Cyanamid Co. at Pearl River, N. Y. The "What Goes On" office at Duke also will serve as a "clearing house" for medical activities in the area, Dr. Nicholson noted. Medical organizations will be invited to check with the office before scheduling meetings, to avoid conflict of dates. The office will offer its services to visiting physicians. The first issue of "What Goes On" is tentatively scheduled for November. Other "What Goes On" publications are available for physicians in New England, New York, and Texas under Lederle auspices.

Announce Radiology Research Grants and Fellowships.—On behalf of the James Picker Foundation, the National Academy of Sciences–National Research Council has announced the award of 10 research grants, six fellowships, and one grant for a scholarship in radiological research for the coming academic year. These awards, totaling about $74,000, were made by the foundation on recommendation of the Committee on Radiology of the Academy–Research Council. The Picker Foundation, with the cooperation of the council, initiated its program of research grants and fellowships in 1950 "to foster research and broaden the scope of radiology." Including the present awards, research grants have been made for support of 39 investigations over the eight-year period. These studies were conducted in 25 laboratories in the U. S., four in Canada, and seven institutions abroad. Three scholars in radiological research have been supported in universities in this country. Fellowships have been awarded to 15 young scientists to enable them to advance their preparation for investigative careers; seven were citizens of foreign countries. Six of these studied in this country or Canada and two of the Americans have carried on their research in England and Sweden. Grants in radiological research for 1958-1959 have been made to the three foreign investigators. Fellowships in radiological research for the coming year included one foreign recipient, and a short-term extension has been granted to a foreign fellow.

Awards for Arthritis Fellowships.—The Arthritis and Rheumatism Foundation offers predoctoral, postdoctoral, and senior investigatorship awards in the fundamental sciences related to arthritis for work beginning July 1, 1959. Deadline for applications is Oct. 31. The awards are intended as fellowships to advance the training of young men and women for an investigative or teaching career. (They are not in the nature of a grant-in-aid in support of a research project.) The program provides for three awards:

(1) Predoctoral Fellowships, limited to students who hold a bachelor's degree; each applicant studying for an advanced degree must be acceptable to the individual under whom the work will be done; fellowships are tenable for one year, with prospect of renewal; stipends range from $1,500 to $3,000 a year, depending upon family responsibilities.

(2) Postdoctoral Fellowships, limited to applicants with the degree of doctor of medicine, doctor of philosophy, or their equivalent; fellowships are tenable for one year, with prospect of renewal; stipends range from $4,000 to $6,000 a year.

(3) Senior Investigator Awards, made to candidates holding or eligible for a "faculty rank" (instructor or assistant professor) and who are sponsored by their institution; stipends are from $6,000 to $7,500 a year and are tenable for five years.

A sum of $500 will be paid to cover the laboratory expenses of each postdoctoral fellow and senior investigator. An equal sum will be paid to cover the tuition expenses of each predoctoral fellow. For information write the Medical Director, Arthritis and Rheumatism Foundation, 10 Columbus Circle, New York 19.

Nominations for Medical Faculty Awards.—The Lederle Laboratories Division of the American Cyanamid Company has announced the sixth year of the Lederle Medical Faculty Awards for the academic year 1959-1960. The purpose of the awards is to assist persons working and contemplating careers in the preclinical departments of medical schools. Recipients must hold faculty rank in their medical schools and must have full privileges and responsibilities for teaching and research as regular members in the sponsoring department. Awards are of four types: (1) to supplement the salary of an individual to enable the department to retain him to perform teaching and research functions vital to the department; (2) to bring into the department a new person, not previously supported either by the departmental budget or by research grants; (3) to continue the salary of an individual previously supported on research grants when those grants have terminated; (4) to offer an opportunity to an individual already experienced in teaching and research to devote his entire or major efforts to the teaching of clinical medicine and patient care as integrated with basic medical sciences. Awards will be made directly to a designated medical school in the U. S. or Canada for a term not exceeding three years. Nominations should be submitted to the Awards Committee through the office of the dean of the medical school and should be endorsed by him and the administrative head of the sponsoring department. Only one candidate from any school will be considered in any given year. The deadline for any nomination is Oct. 31. Address communications to Lederle Medical Faculty Awards, Office of the Secretary, Pearl River, N. Y.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Aug. 9, 1958		Aug. 10, 1957 Total
	Paralytic Type	Total Cases	
New England States			
Maine	..	..	..
New Hampshire	..	..	1
Vermont	1	1	..
Massachusetts	..	1	1
Rhode Island	..	..	..
Connecticut	3	5	..
Middle Atlantic States			
New York	7	10	7
New Jersey	9	16	5
Pennsylvania	1	2	2
East North Central States			
Ohio	3	14	30
Indiana	..	..	8
Illinois	1	5	25
Michigan	23	39	40
Wisconsin	..	2	28
West North Central States			
Minnesota	1	1	6
Iowa	..	5	6
Missouri	4	5	10
North Dakota	..	..	2
South Dakota	..	..	18
Nebraska	..	..	4
Kansas	1	3	6
South Atlantic States			
Delaware	2	3	2
Maryland	..	..	1
District of Columbia	..	..	1
Virginia	5	7	4
West Virginia	3	8	1
North Carolina	..	8	25
South Carolina	..	..	6
Georgia	..	..	4
Florida	4	9	8
East South Central States			
Kentucky	..	..	6
Tennessee	.	8	6
Alabama	3	3	2
Mississippi	..	12	3
West South Central States			
Arkansas	1	3	4
Louisiana	..	1	9
Oklahoma	2	4	7
Texas	11	17	20
Mountain States			
Montana	..	2	1
Idaho	..	..	3
Wyoming	..	..	..
Colorado	..	..	3
New Mexico	1	2	5
Arizona	1	1	3
Utah	..	..	..
Nevada	..	..	..
Pacific States			
Washington	..	..	..
Oregon	..	..	1
California	3	4	33
Territories and Possessions			
Alaska	..	..	..
Hawaii	4	4	..
Puerto Rico	2	2	3
Total	96	207	360

Life Expectancy 20 Years Longer.—The average lifetime of the American people has leveled off in recent years, according to statisticians of the Metropolitan Life Insurance Company. The expectation of life at birth in the United States reached a peak of 69.6 years in 1954, dipped slightly to 69.5 in 1955, and again equaled 69.6 in 1956. Mortality data indicate that the 1957 figure was somewhat lower than in the years immediately preceding, reportedly reflecting the effect of the influenza epidemic in the last quarter of the year. A comparison of 1900 and 1956 life expectancy shows that the 1956 average exceeded by more than 20 years the figure at the turn of the century. According to 1900 mortality conditions, 25% of the newborn would fail to reach their 25th birthday; now only 5% are not likely to attain that age. Similarly, half the children born at the turn of the century could expect to survive to age 58; currently half the newborn can expect to reach age 73. In 1956 the expectation of life at birth for white females was 73.7 years. For girls at age 5, 70.5 years of life remain, about 60 years for those at age 16, and 50 years for those at age 26. For white males, the average length of life in 1956 was 67.3 years, or 6.4 years less than that for females. The difference lessens from 6 years at age 9, to 5 years at age 41, and to 4 years at age 56. The differences between the sexes around 1900 were less than three years at birth and only about one year at age 56. Among nonwhite persons, the expectation of life at birth in 1956 was 61.1 years for males and 65.9 years for females. The average length of life for the nonwhites still lags considerable behind that for the whites. The difference amounts to as much as 7.8 years among females and 6.2 years among males. Since 1900-02 the expectation of life has increased 11.7 years at age 5 and 8.5 years at age 25, the statisticians report. Currently, the expectation of life at age 65 is more than 14 years.

Announce Grants for Bone Research.—Five grants for research on bone formation have been announced by the Easter Seal Research Foundation. A sixth award will make possible a study of the educational needs of cerebral palsied children in the South. The awards, totaling $86,390 and including renewed support to five continuing projects, are from funds raised during the annual Easter Seal campaign. The foundation, established by the National Society for Crippled Children and Adults, supports research dealing with causes and prevention of crippling conditions and improved rehabilitation techniques. Awards went to the following institutions:

Columbia University, College of Physicians and Surgeons, New York City, $15,985—"Basic Mechanisms of Bone Formation," Dr. Charles A. L. Bassett, responsible investigator.

University of North Carolina School of Medicine, Chapel Hill, two grants ($6,785 and $5,865) supporting studies of rickets and other diseases of the bone.

University of Pittsburgh School of Medicine, $5,500—"The Relationships of Embryonic Oxygen Deficiency and the Development of Congenital Malformations," Casimer T. Grabowski, Ph.D., responsible investigator.

Medical College of Virginia, Richmond, $3,450—"The Pathologic Physiology of Fracture Healing as Related to Cerebral Cortical Stimulation," Dr. Earnest B. Carpenter, responsible investigator.

Southern Regional Education Board, Atlanta, Ga., $9,950—"A Study of the Educational Needs of Cerebral Palsied Children in the Southern Region as Related to the Total Medical, Education, and Rehabilitative Program for These Children," William C. Geer, responsible investigator.

Receiving one-year renewal awards were: University of California, Los Angeles ($10,000); University of Mississippi Medical Center, Jackson ($6,000); New York (N. Y.) Medical College ($3,000); Western Reserve University School of Medicine, Cleveland ($8,855); and University of Oklahoma School of Medicine, Oklahoma City.

CORRECTIONS

Dextran Sulfate.—The Foreign Letter item entitled "Alopecia Due to Dextran" in The Journal, June 21 issue, page 1029, should have been entitled "Alopecia Due to Dextran Sulfate." Dextran, a plasma expander, is not related to dextran sulfate, the anticoagulant, and does not cause alopecia.

Organized Home Care Programs.—In the Government Service item from the Public Health Service in The Journal, July 26, page 1651, entitled Organized Home Care Programs it was erroneously stated that Dr. William Stadel was Chairman of the Committee on Chronic Illness of the American Medical Association. Dr. Stadel is Chairman of the Committee on Chronic Illness of the American Hospital Association.

EXAMINATIONS AND LICENSURE

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: The American medical qualification examination to be given henceforth twice a year for foreign medical graduates. Medical Schools in the United States and Foreign Countries, Sept. 23. Final date for filing application was June 23. Dates for the 1959 examinations have been set for Feb. 17 and Sept. 22. Executive Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Illinois.

BOARDS OF MEDICAL EXAMINERS

Alaska:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

California: *Written Examination.* Los Angeles, August 18-21; Sacramento, Oct. 20-23. *Oral Examination.* Los Angeles, August 16; San Francisco, November 15. *Oral and Clinical Examination for Foreign Medical School Graduates.* San Francisco, June 15; Los Angeles, August 17; San Francisco, November 16. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

Colorado: *Endorsement.* Denver, Oct. 14. *Written.* Denver, Dec. 9-10. Exec. Sec., Mrs. Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

District of Columbia:* *Reciprocity.* Washington, September 8. *Examination.* Washington, Dec. 8-9. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave., N. W., Washington 6.

Guam: *Subject to Call.* Act. Sec., Dr. F. L. Conklin, Agana.

Maine: *Examination and Reciprocity.* Portland, Nov. 12-14. Sec., Dr. Adam P. Leighton, 142 High St., Portland.

New Hampshire: *Examination.* Concord, Sept. 10-13. *Reciprocity.* Concord, Sept. 10. Sec., Dr. Mary M. Atchison, Room 101, 61 South Spring St., Concord.

Montana: *Examination and Reciprocity.* Helena, Oct. 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

New Mexico:* *Examination and Reciprocity.* Santa Fe, Nov. 17-18. Sec., Dr. R. C. Derbyshire, 227 East Palace Ave., Santa Fe.

Ohio: *Examination.* Columbus, Dec. 16-18. *Endorsement.* Columbus, August 18; October 6 and Dec. 16-18. Sec., Dr. H. M. Platter, Wyandotte Bldg., Columbus 15.

Oregon:* *Examination.* Portland, Sept. 26-27. Ex. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland 4.

South Dakota:* *Examination.* Rapid City, August 12-13. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

Texas:* *Examination and Reciprocity.* Fort Worth, Dec. 4-6. Sec., Dr. M. H. Crabb, 1714 Medical Arts Building, Fort Worth 2.

Wisconsin: *Examination.* Madison, Sept. 19. Sec., Mr. William H. Barber, 621 Ransom St., Ripon.

Wyoming: *Examination and Reciprocity.* Cheyenne, Oct. 6. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Alaska: *Examination.* Juneau, Nov. 4. Sec., Dr. R. Harrison Leer, Room 204, Alaska Office Bldg., Juneau.

Arkansas: *Examination.* Little Rock, Oct. 6-7. Sec., Dr. S. C. Dellinger, Zoology Department, University of Arkansas, Fayetteville.

District of Columbia: *Reciprocity.* Washington, September 8. *Examination.* Washington, Nov. 13-14. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave., N. W., Washington 6.

Kansas: *Examination and Reciprocity.* Kansas City, Nov. 24-25. Sec., Dr. L. C. Heckert, Pittsburg.

Michigan: *Examination.* Ann Arbor and Detroit, Oct. 10-11. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., W. Michigan Ave., Lansing 15.

Oklahoma: *Examination and Reciprocity.* Oklahoma City, Sept. 26-27. Sec., Dr. E. F. Lester, 813 Braniff Bldg., Oklahoma City.

Texas: *Examination.* Oct. 13-14. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

Wisconsin: *Examination.* Madison, Sept. 19 and Milwaukee, Dec. 6. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

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*Basic Science Certificate required.

dation in Rochester, Minn.; clinical instructor in ophthalmology at his alma mater; associated with Children's Hospital of the East Bay in Oakland, Herrick Memorial Hospital, and the Alta Bates Hospital, where he died July 12, aged 43, of leukemia.

Duffy, Joseph Benedict Ⓜ Centralia, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1935; served as a director and president of the First National Bank of Centralia before its merger with the Pennsylvania National Bank and Trust Company of Pottsville; chairman of the advisory board of the institution; died in the Jefferson Medical College Hospital, Philadelphia, July 4, aged 48.

Duncan, William Stevenson Ⓜ Pittsburgh; born in Tarentum, Pa., April 14, 1920; Hahnemann Medical College and Hospital of Philadelphia, 1945; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the International College of Surgeons and the American College of Surgeons; interned at Presbyterian Hospital; served a residency at the Elizabeth Steel Magee Hospital, where he was a member of the staff, and the Pittsburgh Medical Center; a first lieutenant in the U. S. Army, 1946-1947; clinical instructor in obstetrics at the University of Pittsburgh School of Medicine; associated with the Montefiore Hospital; consultant, obstetrics and gynecology, Allegheny Valley Hospital in Tarentum; died in Van Buren Bay, N. Y., July 7, aged 38, of coronary disease.

Eagle, James Carr, Spencer, N. C.; Jefferson Medical College of Philadelphia, 1923; member of the American Academy of General Practice; past-president of the Rowan County Medical Society; for many years member and chairman of the school board; on the staff of the Rowan Memorial Hospital, Salisbury, where he died July 14, aged 59, of a heart attack.

Emerson, Ralph Waldo ⓂTopeka, Kan.; University of Kansas School of Medicine, Kansas City, Kan., 1921; veteran of World War I; past-president of the Shawnee County Medical Society; died in the Stormont Vail Hospital July 1, aged 65, of bronchogenic, carcinoma.

Englander, Charles Ⓜ Newark, N. J.; born in Newark Sept. 6, 1890; Medico-Chirurgical College of Philadelphia, 1916; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychosomatic Society, American Psychiatric Association, and the Association for Research in Nervous and Mental Disease; veteran of World War I; served on the staff of the Neurological Institute in New York City, Essex County Hospital for Contagious Diseases in Belleville, Newark City Hospital, and Newark Beth Israel Hospital; consultant, Newark Eye and Ear Infirmary and the Irvington (N. J.) General Hospital; for many years chief pathologist, Essex County Overlook Hospital in Cedar Grove, where he died July 14, aged 67, of coronary disease.

Eschelbacher, Leo Joachim Ⓜ Mount Vernon, Ill.; Universität Basel Medizinische Fakultät, Switzerland, 1936; died in the Barnes Hospital, St. Louis, July 9, aged 47, of viral hepatitis.

Evans, David Phillip Ⓜ East Orange, N. J.; University of Virginia Department of Medicine, Charlottesville, 1926; member of the American Academy of Pediatrics; veteran of World War II; chief of the pediatric department at Orange (N. J.) Memorial Hospital, where he died July 13, aged 59, of acute coronary occlusion.

Eubanks, John Edward Ⓜ East St. Louis, Ill.; University of Illinois College of Medicine, Chicago, 1927; veteran of World War I; associated with St. Mary's Hospital in East St. Louis and Homer G. Phillips Hospital and St. Mary's Infirmary in St. Louis, where he died July 2, aged 62, of empyema, pulmonary infarction, and arteriosclerotic heart disease.

Fawcett, Charles Emerson, Dormont, Pa.; University of Pittsburgh School of Medicine, 1909; an associate member of the American Medical Association; died July 11, aged 73.

Feasler, Charles Herbert, Beverly Hills, Calif.; Illinois Medical College, Chicago, 1905; member of the American Psychiatric Association; died in St. John's Hospital, Santa Monica, June 8, aged 77.

Fischer, Morris, Brooklyn; Long Island College Hospital, Brooklyn, 1921; on the staff of the Madison Park Hospital of Adelphi College; died in the Jewish Hospital June 15, aged 61, of carcinoma of the stomach with cerebral and spinal metastases.

Foster, Wilmot Coyne Ⓜ Portland, Ore.; born in Sheridan June 21, 1893; University of Oregon Medical School, Portland, 1920; fellow of the American College of Surgeons; for four years fellow in surgery at the Mayo Clinic, Rochester, Minn., where he was made first assistant in the department of surgical anatomy; served as president and secretary-treasurer of the Board of Medical Examiners of the state of Oregon, of which he was a member since 1944; elected to the executive committee of the Federation of State Medical Boards in 1957; at one time on the faculty of his alma mater; chairman of the medical department of Selective Service System during World War II; chief surgeon for the Portland Gas and Coke Company; surgical consultant for the American Can Company; member of the medical staff of St. Vincent Hospital, where he served as chief of staff in

1952 and chief of surgery 1954-1955; member of the medical staffs of Providence, Physicians and Surgeons, and Emanuel hospitals; died July 4, aged 65.

Frey, Jesse Jacob Ⓢ Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1901; past-president of the Nashville Society of Ophthalmology and Otolaryngology; associated with the Nashville General Hospital; died July 3, aged 81.

Frisch, Felix Ⓢ Trenton, N. J.; Medizinische Fakultät der Universität, Vienna, Austria, 1905; on the staff of the McKinley Hospital, where he died July 5, aged 78, of myocardial infarction, and coronary occlusion.

Goodman, Samuel Ⓢ New York City; Fordham University School of Medicine, New York City, 1918; died in Mount Sinai Hospital July 12, aged 66.

Grove, Thomas Leon Ⓢ Saluda, Va.; Medical College of Virginia, Richmond, 1939; veteran of World War II; county medical examiner; died July 2, aged 43.

Haggart, Harry Humphrey Ⓢ Cincinnati; Johns Hopkins University School of Medicine, Baltimore, 1921; specialist certified by the American Board of Otolaryngology; member of the American Society of Plastic and Reconstructive Surgery and the American Academy of Ophthalmology and Otolaryngology; on the staffs of the Children's and Christ hospitals; died July 13, aged 66.

Helbing, Harry Hugh Ⓢ St. Louis; American Medical College, St. Louis, 1895; Homeopathic Medical College of Missouri, St. Louis, 1901; served on the staffs of the Evangelical Deaconess Hospital and the St. Louis City Hospital; died July 4, aged 89, of paralysis agitans.

Henry, John Philips Ⓢ Memphis, Tenn.; University of Tennessee College of Medicine, Memphis, 1917; associate professor of medicine at his alma mater; member of the American College of Allergists; fellow of the American College of Physicians; veteran of World War I; on the staffs of Baptist Memorial and John Gaston hospitals; died July 4, aged 65, of massive gastric hemorrhage.

Herrington, Lee Richard Sr., New Salem, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1897; served as county coroner; died in the Uniontown (Pa.) Hospital June 26, aged 90.

Hillyer, Ernest Elwood, Staten Island, N. Y.; Long Island College Hospital, Brooklyn, 1898; an associate member of the American Medical Association; died in Staten Island Hospital July 5, aged 90, of coronary arteriosclerosis.

Hitt, Ashby J., Tower Hill, Ill.; National Normal University College of Medicine, Lebanon, Ohio, 1893; died in the Huber Memorial Hospital, Pana, June 20, aged 95.

Hogshead, J. McChesney Ⓢ Chattanooga, Tenn.; University College of Medicine, Richmond, 1903; member of the American Academy of Ophthalmology and Otolaryngology; died July 13, aged 82.

Hollingsworth, Samuel Glen Ⓢ Bradenton, Fla.; Hering Medical College, Chicago, 1897; past-president of the Florida State Board of Medical Examiners, of which he was a member for many years; formerly school physician; died July 13, aged 87, of bronchopneumonia.

Hopkins, John Rolph Ⓢ Denver; University of Toronto Faculty of Medicine, Toronto, Ontario, Canada, 1893; L.R.C.P., Edinburgh, Scotland, 1893; for many years on the staff of St. Anthony's and St. Joseph's hospitals; died June 11, aged 87, of coronary thrombosis.

Jones, Garnett Ⓢ St. Clair, Mo.; Barnes Medical College, St. Louis, 1907; past-president of St. Louis County Medical Society; died in the Evangelical Deaconess Hospital in St. Louis, June 30, aged 91, of pneumonia.

Joyce, William Michael Ⓢ Middletown, Conn.; Jefferson Medical College of Philadelphia, 1917; specialist certified by the American Board of Otolaryngology; fellow of the American College of Surgeons; veteran of World Wars I and II; associated with Connecticut State hospital and the Middlesex Memorial Hospital; died July 1, aged 65.

Karen, Benjamin Ⓢ New York City; University and Bellevue Hospital Medical College, New York City, 1924; served as secretary of the Bronx County Medical Society; associated with Morrisania Hospital and the Bronx Hospital, where he died July 1, aged 58, of aortic insufficiency, and pulmonary infarction.

Kelley, Catherine Rose, New York City; Tufts College Medical School, Boston, 1909; specialist certified by the American Board of Internal Medicine; an associate member of the American Medical Association; served on the staffs of the Bellevue, Doctors, and Misericordia hospitals; died in Nashua, N. H., July 14, aged 82, of cerebrovascular thrombosis.

Kirk, Albert Wellington Ⓢ Berkeley, Calif.; College of Physicians and Surgeons of San Francisco, 1900; died July 5, aged 88.

Labensky, Alfred Ⓢ New London, Conn.; Yale University School of Medicine, New Haven, 1921; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; past-president and secretary of the New London County Medical Society; associated with Lawrence and Memorial Associated Hospitals; consulting physician, Norwich (Conn.) State Hospital and the Seaside in Waterford; died July 7, aged 66.

Lange, Horst Ⓜ Seaford, N. Y.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1927; member of the American Trudeau Society and the American Academy of General Practice; died June 15, aged 56, of cardiovascular accident.

Lassen, Fritz Ⓜ Pueblo, Colo.; Ludwig-Maximilians-Universität Medizinische Fakultät, München, Bavaria, Germany, 1903; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; co-founder of the Parkview Episcopal Hospital; died June 30, aged 82, of coronary occlusion.

Lederman, Edward Isadore Ⓜ Baltimore; University of Cincinnati College of Medicine, 1941; specialist certified by the American Board of Anesthesiology; member of the American Society of Anesthesiologists; veteran of World War II and was awarded the Silver Star, two Bronze Stars and Combat Medical Badge; associated with Sinai and Provident hospitals; died June 7, aged 44, of myocardial infarction.

Leedy, Gladys June Ⓜ Indianapolis; Indiana University School of Medicine, Indianapolis, 1948; served on the staff of the Central State Hospital; on the staff of the regional Veterans Administration office; found dead June 30, aged 39.

Leigh, Horace Ⓜ Yonkers, N. Y.; Queen's University Faculty of Medicine, Kingston, Ontario, Canada, 1935; veteran of World War II; member of the American Society of Anesthesiologists; associated with St. Agnes Hospital in White Plains, Grasslands Hospital in Valhalla, and St. Luke's Hospital in New York City; died July 8, aged 52, of heart disease.

Leinoff, Harry David Ⓜ New York City; New York Homeopathic Medical College and Flower Hospital, New York City, 1927; associate professor of medicine at New York Medical College, Flower and Fifth Avenue Hospital; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; veteran of World War II; associated with Flower and Fifth Avenue Hospitals, Metropolitan, and Bird S. Coler Memorial hospitals; died July 21, aged 53.

Leith, Leroy Rhodes, Exeter, Mo.; College of Physicians and Surgeons, Baltimore, 1893; died May 21, aged 88.

Lund, Henry Joseph, Monterey, Calif.; Washington University School of Medicine, St. Louis, 1924; veteran of World War I; died in the Monterey (Calif.) Hospital July 2, aged 61.

McClellan, George Sterling Ⓜ Pompano Beach, Fla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1912; charter member and past-president of the Broward County Medical Society; a former member of the state board of medical examiners; served in France during World War I; associated with the North Broward General Hospital in Fort Lauderdale; died in the Holy Cross Hospital, Fort Lauderdale, June 23, aged 67, of pulmonary edema due to myocardial infarction due to arteriosclerotic heart disease.

McCue, Francis Joseph, Hudson, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; died in the Thorn Memorial Hospital June 8, aged 81.

McTague, William Francis, New York City; Jefferson Medical College of Philadelphia, 1917; veteran of World War I; formerly associated with the Ellis Island immigration station, U. S. Public Health Service; on the staffs of Fordham and St. Elizabeths hospitals; died in the Veterans Administration Hospital July 7, aged 68.

Maloney, Thomas William, Detroit; Albany (N. Y.) Medical College, 1911; served as president of the Lake Keuka Medical and Surgical Association; veteran of World Wars I and II; associated with the Veterans Administration; died July 4, aged 73, of left ventricular failure, myocardial infarction, and arteriosclerotic heart disease.

Mann, Joseph Lee Ⓜ Lieut. Colonel, M. C., U. S. Air Force, Hampton, Va.; University of Virginia Department of Medicine, Charlottesville, 1938; member of the Industrial Medical Association; interned at Norfolk General Hospital in Norfolk, Va.; veteran of World War II; died in the U. S. Air Force Hospital, Langley Air Force Base, March 19, aged 43, of metastatic bronchogenic carcinoma.

Martin, Albert J. Ⓜ East Prairie, Mo.; Beaumont Hospital Medical College, St. Louis, 1896; died July 3, aged 87, of a heart attack.

Milos, James Leopold Ⓜ Chicago; Loyola University School of Medicine, Chicago, 1931; served on the staff of St. Francis Hospital in Blue Island; died July 18, aged 52, of coronary occlusion.

Nielsen, Edwin Bjorne Ⓜ Boston; Harvard Medical School, Boston, 1899; died July 3, aged 81.

Pennell, Melvin Thomas Ⓜ Alton, Ill.; St. Louis University School of Medicine, 1941; interned, U. S. Marine Hospital, Boston; served a residency at St. Mary's Group of Hospitals, St. Louis; specialist certified by the American Board of Obstetrics and Gynecology; served on the faculty of his alma mater; veteran of World War II; on the staffs of the Alton Memorial Hospital and St. Joseph Hospital, where he died July 5, aged 42, of spongioblastoma.

Pentel, Louis Simon Ⓜ West New York, N. J.; Baylor University College of Medicine, Dallas, 1925; died in the North Hudson Hospital July 1, aged 61.

Perelman, Julius Samuel Ⓜ West Orange, N. J.; University of Vermont College of Medicine, Burlington, 1935; died in Honolulu, Hawaii, July 11, aged 48.

Perkins, Roscoe Livingstone, Royal Oak, Md.; Hahnemann Medical College and Hospital of Philadelphia, 1907; an associate member of the American Medical Association; veteran of World War I; formerly practiced in Harrisburg, Pa.; died June 27, aged 79.

Poindexter, Frank Wilmore Ⓜ Newport News, Va.; Medical College of Virginia, Richmond, 1913; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staffs of the Riverside and Mary Immaculate hospitals; died July 4, aged 70, of coronary thrombosis.

Pratt, Roscoe Wellington, Park Ridge, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1911; retired member of the medical board of the New York Life Insurance Company in New York City; died in McHenry July 15, aged 68, of carcinoma of the right lung.

Ransbottom, Irah James, Coldwater, Ohio; Cincinnati College of Medicine and Surgery, 1892; veteran of World War I and the Spanish-American War; died in the Gibbons Hospital, Celina, June 20, aged 88.

Reed, Theodore Byington Ⓜ Wilton, Conn.; Cornell University Medical College, New York City, 1916; veteran of World War I; formerly practiced in New York City, where he was on the faculty of Columbia University College of Physicians and Surgeons; member of the Medical Society of the State of New York; served on the staff of the New York Nursery and Child's Hospital in New York City; died July 2, aged 69.

Reinders, Otto W., Riverside, Conn.; Washington University School of Medicine, St. Louis, 1891; died in Stamford May 7, aged 91, of arteriosclerotic heart disease.

Rozentals, Peteris Voldemars, Louisville, Ky.; Latvijas Universitāte Medicinas Fakultate, Riga, Latvia, 1929; on the staff of Hazelwood Sanatorium, where he died May 20, aged 54, of carcinomatosis.

Rubin, Isidor Clinton Ⓜ New York City; born in 1883; Columbia University College of Physicians and Surgeons, New York City, 1905; specialist certified by the American Board of Obstetrics and Gynecology; member of the American Association of Obstetricians and Gynecologists and the American Gynecological Society, of which he was past-president; fellow of the American College of Surgeons and the International College of Surgeons; in 1941 received a Certificate of Merit from the American Medical Association for a scientific exhibit illustrating diagnosis of impaired tubal function by kymographic uterotubal insufflation and soluble viscous contrast medium; formerly clinical professor of obstetrics and gynecology at his alma mater and the New York University College of Medicine; on the staffs of the Mount Sinai, Beth Israel, Harlem, and Montefiore hospitals; developed the Rubin Test; an officer of the French Legion of Honor; author of books on his specialty; on the editorial board of *Fertility and Sterility;* died in London, England, July 10, aged 75, of coronary sclerosis and hypertensive heart disease.

Sheets, Cecil Clarence Ⓜ Paulsboro, N. J.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1923; died May 26, aged 57, of acute coronary occlusion.

Snow, Bruce Ⓜ Manchester, N. H.; Harvard Medical School, Boston, 1919; member of the American Academy of General Practice and served as director of the New Hampshire branch; associated with the Elliot Hospital; died July 1, aged 63, of cancer.

Weinstein, David Ⓜ Opelousas, La.; Tulane University School of Medicine, New Orleans, 1943; served on the faculty of his alma mater; veteran of World War II and was awarded the Silver and Bronze Stars for bravery at Iwo Jima; past-president of the Rotary Club in Opelousas and St. Landry Parish Medical Society; member of the board of directors of St. Landry Bank and Trust Company; died in the Touro Infirmary, New Orleans, June 29, aged 40, of metastatic carcinoma of the stomach.

Woodall, John L., Lavinia, Tenn.; (licensed in Tennessee in 1889); died May 26, aged 88.

Woodman, James Brown Ⓜ Franklin, N. H.; Dartmouth Medical School, Hanover, 1903; fellow of the American College of Surgeons; veteran of World War I; served on the city council and board of education; vice-president of the Franklin Savings Bank; associated with the Franklin Hospital, where he died June 28, aged 79, of acute coronary thrombosis.

FOREIGN LETTERS

BRAZIL

Pulmonary Cavitation.—The problem presented by the tuberculous pulmonary cavity is apparently becoming aggravated by the wide use of antibiotics and chemotherapy. Dr. Radyr de Queiroz and co-workers of the São Paulo State University presented to the Associação Paulista de Medicina a series of 14 such patients, for 6 of whom resection had been performed. When sputum smears, cultures, and guinea pig inoculations are repeatedly negative for Mycobacterium tuberculosis and x-ray examination reveals the persistance of the cavity, it may be concluded that the cavity is undergoing open healing or is already healed. We may make a diagnosis of cystic cavitation only when, by serial x-ray examinations, it is possible to recognize the cavity in the beginning of the treatment and at the different stages of the healing. A cystic cavity should not be confused with bubbles of emphysema which are found in nonspecific pneumopathies as well as in tuberculosis. The pulmonary tissue around the cystic cavity may be free from tubercles or present extensive tuberculous changes. The diagnosis of open healing of the tuberculous cavity can be made only after a long observation. Besides the risk of reactivation of the tuberculous infection, the cystic cavity may be complicated by hemorrhage, suppuration, and functional disturbances. Considering all these factors, it is advisable, if possible, to resect the lesion.

Cystic cavities may be one to several centimeters in diameter and may even reach the size of a whole lobe. As a rule, these cavities are spherical but they may be tortuous. Their walls are generally thin, but may be partially thickened at points where they adhere to precavitary fibrous tissue. Their internal lining is smooth and shiny like a serous membrane. The cavities are empty, although occasionally they contain small yellow fibrinous clots or even caseous matter. Histologically, there is a complete alteration of the structure of the cavity, the wall consisting of collagen fibers with a variable number of fibroblasts and scant vascularization. The drainage bronchus is patent and its mucosa is practically normal.

Inoperable Cancer of Uterine Cervix.—Dr. A. S. Pereira and co-workers (*O hospital*, vol. 53, June, 1958) stated that in the course of inoperable cancer of the cervix uteri there is a phase of pain in relation to the autonomic nervous system and another phase in which pain is provoked by stimulation of afferent pathways of the central nervous system. Accordingly, two types of operative treatment may be used. The authors performed abdominopelvic sympathectomies (resection of the hypogastric nerve, aortic plexus, lumbar sympathetic chains, and plexus of the iliac arteries and of the inferior mesenteric artery) with complete relief of pain. These patients continued without pain as long as the cancer was limited to structures innervated by the autonomic nervous system, but when it invaded structures innervated by the central nervous system the pain reappeared. The best results were obtained when the tumor was irradiated postoperatively. In patients with inoperable cancer of the cervix uteri suffering from intractable hypogastric and lumbosacral pain radiating to the lower extremities, bilateral cervical cordotomy was performed at levels between the first and third cervical vertebras, with complete relief of pain. Temporary urinary retention was observed, but this disappeared entirely in a few days.

Midline Episiotomy.—Dr. L. C. da Costa (*Revista de ginecologia e d'obstetricia* 52:153, 1958) performed a midline episiotomy on 500 patients of whom 311 were primiparas. In 66 the delivery was performed by forceps, and in 6 there was breech presentation. Six of the patients gave birth to twins. Of the 506 infants, 19 were premature, 60 weighed more than 3,500 Gm. (7.7 lb.), and 13 weighed more than 4,000 Gm. (8.8 lb.). Episiotomy is the most frequent obstetrical operation. In about half of the patients in this series the wound was repaired by means of an intradermal suture. The author avoided the midline incision in women with a short perineum or when difficulties were anticipated from midforceps delivery, breech extraction, unfavorable subpubic arc, or large fetus. Local or caudal anesthesia was used for all patients. No postoperative incontinence or feces or rectovaginal fistula was observed. Midline episiotomy should be performed only by sufficiently trained surgeons in selected cases.

Trypanosomiasis.—Dr. S. B. Gonçalves, (*O hospital* 53:799, 1958) stated that Trypanosoma cruzi produces in the host allergic lesions such as interstitial myocarditis which may be reproduced experimentally by inoculation with dead trypanosomes. T.

The items in these letters are contributed by regular correspondents in the various foreign countries.

cruzi undergoes a metabolic cycle in which protease, histidinedecarboxylase, and histaminase, metabolites derived from histamine, are produced and used by the trypanosomes in their development. In this cycle, the glycogen deposited in the muscle plays an important role, favoring the digestion of proteins. Substances that inhibit the action of histamines, such as isoniazid, chlortetracycline, and oxytetracycline, aggravate the infection produced by T. cruzi. Substances that increase glycogen deposit, such as cortisone and hydrocortisone, similarly aggravate the infection. Certain hypoglycemic substances, suramin and various diamidines, possess a trypanosomicide action for the African trypanosomas, more adapted to the parasitic life than T. cruzi and therefore more sensitive to the antimetabolic action of these drugs. The author observed that carbutamide exercised a marked influence, decreasing the extent of interstitial myocarditis produced by T. cruzi in mice.

Brazilian Trypanosomiasis.—Dr. P. F. Pereira and co-workers (*Revista Goiana de Medicina*, vol. 4, Jan.-March, 1958) showed that in the hypertrophic phase of megaesophagus in patients with Brazilian trypanosomiasis the absolute number of muscle fibers is increased to almost six times the normal. Thus the so-called hypertrophy of the muscle fibers represents hyperplasia as well as hypertrophy.

CANADA

Congress of Obstetrics and Gynecology.—The Second World Congress of Obstetrics and Gynecology, arranged by the International Federation of Gynecology and Obstetrics, was held in Montreal in June. In a conference on toxemias of pregnancy, Toppozada of Egypt outlined work showing the existence of placental toxin, present in toxemic pregnancy and inhibited in normal pregnancy. He had used injections of amniotic fluid from normal women to treat patients with eclampsia and preeclampsia with favorable results. Kotasek of Prague noted that in toxemia values in the blood for antidiuretic hormone rose with the severity of the disease. McCall of New Orleans condemned intravenous administration of barbiturates, preferring to rely on sedation with 50% magnesium sulfate intramuscularly plus hydralazine and veratrum viride. Rodriguez-Lopez of Montevideo gave 10 cc. of 1% procaine intravenously to patients with severe toxemia. In a conference on anemia of pregnancy Lowenstein of Montreal showed the difficulty of defining normal blood values in pregnancy. Llewellyn-Jones of Malaya reported values regarded as normal in Malayan pregnant women which would be abnormal in the West. Any hemoglobin value down to 6.5 Gm.% was considered normal. Below this level 25% had megaloblastic anemia and the rest had iron deficiency anemia. Green-Armytage of London stated that blood transfusion was dangerous and that he used it only as a last resort for anemia in pregnant women. In such patients he gave only 350 cc. at a time.

Three approaches to phlebitis were described. Shute of London, Ontario, treated chronic phlebitis with 800 to 2,000 units of alpha-tocopherol daily. Chalmers of Worcester, England, in treating postoperative and puerperal phlebitis used paravertebral block and also found a new sympathicolytic agent PH203 (a combination of Panthesin and Hydergin) promising. Braden of New Orleans advocated phenylbutazone in patients with superficial phlebitis. Another use for phenylbutazone was described by Black of Winnipeg who gave 100 mg. three times a day for several days for dysmenorrhea. Fitzgerald of England noted that the diagnostic signs of air embolism in the third stage of labor were hyperpnea, extreme pallor in the limbs, and a degree of shock out of proportion to blood loss. Gavel of France used a combination of dibucaine and thiopental intraspinally for difficult cesarean sections. Hobbs of Vancouver recommended promethazine with meperidine for safe and effective sedation in labor. For stress incontinence, Mulvany of Pawtucket, R. I., used various types of vesicourethrolysis, and Taleghany of Persia used a modified Marshall urethrocystopexy with a Foley catheter in the bladder. Chalmers of England also used urethrocystopexy with a high degree of success but preferred an ordinary rubber catheter to Foley's type in the bladder. Jeffcoate of Liverpool believed that there was probably a place for urethrocystopexy and sling operations in patients with stress incontinence with little to choose between them, though the relapse rate after the latter operation is lower. He had a 90% success rate for his whole series.

In a discussion on psychoprophylaxis of labor, the method based on Pavlovian principles first introduced in Russia and the method known as natural childbirth in use in the United Kingdom and the United States were found to be similar in principle. No one disputed the need for educating the pregnant woman, but there was some doubt whether antenatal preparation modified the course of labor. De Watteville of Geneva described his studies of pregnandiol excretion which suggested that the onset of uterine contractions in abortion was not related to luteal deficiency and that progesterone treatment of the condition was therefore useless. Fortin of Montreal discussed premenstrual tension, noting that while fluid retention played a part in symptoms emotional factors were even more significant. He believed psychotherapy might help. At a conference on uterine inertia, oxytocin given by continuous intravenous drip was recommended for simple inertia, but the care of incoordinated uterine action was believed to present a more difficult problem. It was doubtful whether oxytocin could change this into coordinated action, though rupture of the membranes might change the pattern of activity.

Hospital Insurance and Diagnostic Services.—As of July 1, 5 of the 10 Canadian provinces had signed agreements with the federal government for a universally available hospital and diagnostic services insurance scheme. A little before these schemes went into effect, the Minister of National Health and Welfare told the annual meeting of the Canadian Medical Association that the hospital insurance and diagnostic services program was not a single national project but rather a series of provincial projects, uniform as to essentials but differing in many respects. He regarded as basic features (1) universal availability of benefits to residents of a province on uniform terms; (2) assurance of high standards of hospital care; and (3) provision of certain basic in-patient services, including accommodation at standard ward level; nursing; laboratory, radiological, and other diagnostic procedures; certain drugs; use of operating room and anesthetic facilities; routine surgical supplies; and the use of radiotherapy and physiotherapy facilities where available. A province could choose which drugs and which outpatient services, if any, it would provide on an insured basis. It seemed that Newfoundland and possibly other Atlantic provinces would provide an outpatient program, whereas Ontario would limit outpatient coverage to emergency diagnosis and treatment of accident victims only. As regards financing, the provinces would be free to raise their 50% share of the expenses as they pleased; some intend to use general tax revenues, others premiums or special sales taxes.

The man in the street would be called on to play a larger role with regard to his local hospital and take an intelligent and more active interest in its operation. The present pattern of hospital ownership would be maintained and nothing would be done to interfere with their independence, but they would be expected to assume greater responsibility for efficient and careful administration. The provincial authority would scrutinize their annual budget, and medical staffs would have to cooperate in preventing improper use of beds. The minister said that he would never recommend to the government anything which in any way would interfere with the patient-doctor relationship and that the new act was not intended to apply to clinical services furnished by physicians to individual patients in hospital. He said that he believed the necessary interpretations by physicians of laboratory, radiological, and other diagnostic services were integral components of good hospital care—a point of view that the radiologists and clinical pathologists will not find very reassuring since they are trying to have their services recognized as "physicians' services" and not "hospital services." The minister agreed that such procedures as bronchoscopy, gastroscopy, or ophthalmoscopy were aspects of a medical care program and had no place in his scheme. The physician was to be paid for these by his patient. The minister reassured the profession about two areas in which concern had been expressed, namely, education and research. He was keenly aware of the need for maintaining traditional patterns in medical training and therefore of providing in teaching hospitals an adequate number of teaching beds and additional financing. The present methods of financing medical research projects would not be interfered with, and research would receive some support from the scheme in some hospitals.

Public Relations and Economics.—At the June meeting of the general council of the Canadian Medical Association, the reports of the committee on public relations and the committee on economics received special attention. The council believed that one of the major activities of the public relations committee should be to assist in presenting the collective opinion and advice of Canadian physicians to the federal government and the Canadian people as regards national health legislation. Certain members of the council believed that criticisms and comments offered to the Department of National Health and Welfare by the Canadian Medical Association through its advisory committee had had little effect on the wording or intent of the Hospital Insurance and Diagnostic Services Act. They were anxious that all members of the Canadian parliament should be aware that the Association, as the mouthpiece of organized medicine in Canada, had expressed serious concern about certain features of the act, such as the differentiation of "physicians' services" from "hospital services." A resolution was therefore passed calling on the executive committee of the Canadian Medical Association to plan, in consultation with the public relations committee, a program that would insure a more effective expression of the Association's opinion to the federal government and the Canadian people.

As regards economics, progress was reported in the relative values study. This study is being undertaken to assess the relative value of various procedures in medical practice. It is under the guidance of a central committee of five persons, two physicians from university circles and three from private nonuniversity practice, who, with the assistance of management engineers, are devising a method of weighting the points allocations to various factors concerned in diagnosis and treatment. A proforma will be developed and forwarded to some 400 physicians across Canada for analysis of a number of procedures. Each of the 10 divisions will select physicians to take part in this analysis and the group may ultimately comprise 3 to 4% of the medical profession, representing all fields of medical practice.

The council debated at length the question of arbitration and negotiation between physicians and employing bodies. There are major differences in employer-employee relationships, between physicians practicing medicine and other employees presently subject to compulsory arbitration. It is difficult to negotiate compulsory arbitration arrangements for the profession when payments are made on a fee-for-service basis, but the council adopted a new paragraph for inclusion in the "Statement of Policies and Principles on Health Insurance in Canada," emphasizing the need for any member or group of members of the medical profession to be given the same fundamental rights as other citizens in choosing the type and location of practice and in negotiating agreements covering methods of remuneration, conditions of professional service, and modification or termination of contracts. The Canadian Medical Association and its divisions accept responsibility for collective bargaining on behalf of a salaried physician. This acceptance means that there is no need for physicians to be active members of any union. In relation to health insurance plans the council agreed that such plans should be administered at the provincial level by a commission representative of those persons providing and receiving the service. They also agreed that whenever medical services are provided to persons whose care is a responsibility of government or other third party, the professional component of this care may be compensated for separately and preferably in accord with an agreement based on fee-for-service.

Persistence of Poliomyelitis Antibodies.—The village of Saint-Augustin, Quebec, is very isolated, being accessible only to ships in summer and planes in winter. In January, 1950, an epidemic of poliomyelitis struck the village, possibly reaching this community via one of the rare visitors. Of the 417 people living in the village, 33 were attacked, 13 being paralytic cases. Only children aged 2 to 14 years were attacked. Pavilanis and Frappier (*Canad. M. A. J.* 79:11, 1958) described laboratory studies at the time of the epidemic and later. During the epidemic 90% of the children of the village were excreting poliovirus type 1. Two years later nobody was excreting virus. After the epidemic, almost all the population had antibodies to poliovirus types 1 and 2, but children examined before the onset of symptoms had no antibodies to type 1. Moreover there was a sharp distinction at the age of 10. Children up to 10 years old had either no type 2 antibodies or only a low titer, whereas at age 11 or over children had a high titer of type 2 antibodies. It seems that there was an epidemic in 1939, 11 years before the second epidemic, and that the first epidemic due to type 2 virus had left a high titer of antibodies in the population and also apparently conferred some resistance to type 1 virus.

FRANCE

Chorea and Rheumatic Fever.—R. Lutembacher (*Presse méd.* 66:1067, 1958) called attention to the close connection between chorea and rheumatic fever. The cardiac lesions were shown to be grossly and histologically identical. Chorea may occur before any inflammatory manifestation, or its onset may be associated with an acute inflammatory process that develops in the joints or serous membranes. The adrenal insufficiency, as detected by assessment of the blood corticosteroid level, was equal to that observed in rheumatism in the third week of its course. The motor incoordination was controlled by antirheumatic chemotherapy or by hormones. One should not overlook the use of such a treatment as a means of preventing postchoreic *cardiopathies.*

Electrocardiograms.—Maurice Pestel (*Presse méd.* 66:644, 1958) stated that electrocardiography, even though helpful, is far from infallible. In addition to the frequent discrepancies between the anatomic changes and the electrical alterations, there may be some uncertainty in the reading of the tracings. A study of 100 tracings as interpreted by different cardiologists emphasized the profound disagreement that may exist in the interpretation of normal as well as abnormal tracings. Furthermore, the fact that in about 16% of cases the same tracings submitted to the same experts on a second occasion were interpreted in a different fashion was evidence of a lack of exact standards of interpretation.

Pulmonary Decortication.—Henri Le Brigand (*Presse méd.* 66:1089, 1958) believes that decortication makes it possible to remove a pouch from a purulent pleurisy and to secure the reexpansion of the underlying lung and the recovery of its function. The procedure is feasible since there remains a cleavable plane between the pachypleuritis that coats the lung and the underlying visceral pleura. The external wall of the pouch, as made of a parietal pachypleuritis, remains also separable from the thoracic wall. Nevertheless, the cleavage plane may be of varying quality on the inner side as well as on the outer side. In patients in whom both splitting procedures are readily performed, it is possible to remove en bloc a pouch of chronic purulent pleurisy and ensure an excellent pulmonary reexpansion. Otherwise, the splitting process induces varying difficulties. On the visceral side it may be feasible only at the expense of a certain number of breeches of the cortex. On the parietal side it may cause hemorrhage and necessitate leaving in situ a more or less extensive area of pachypleuritis. Whatever the difficulties, decortication should no longer consist merely in removing the visceral cover of the lung and allowing the pulmonary areas thus released to reexpand. One must always perform such a total pneumolysis as makes possible a total and harmonious reexpansion of the lung.

The presence of underlying pulmonary foci may necessitate more or less extensive pulmonary resections, this being rarely seen in those decortications performed for common purulent pleurisy or for pyohemothorax but more frequently seen in patients with tuberculous pleurisy. Meticulous postoperative care is necessary, especially perfect drainage, to assure the evacuation of the effusion and the return of the lung to the thoracic wall. The postoperative death rate for this operation is less than 1%. Such complications as hemorrhage requiring reoperation are relatively frequent. Remote results are excellent. In some patients the persistence of a residual pouch may necessitate a secondary thoracoplasty. There is no absolute parallelism between the value of the anatomic recovery and that of the functional recovery in the lung.

Pleural Manifestations in Cirrhosis.—Poinso and Chanas (*Presse méd.* 66:1106, 1958) studied a series of 400 patients with cirrhosis, of whom 174 had atrophic portal cirrhosis, 138 had hypertrophic cirrhosis, 5 had cirrhosis with an atrophohypertrophic form, 15 had pigmentary cirrhosis, 9 had metaicteric cirrhosis, 3 had cardioethylic cirrhosis, 2 had fatty cirrhosis, 1 had cholostatic cirrhosis, 2 had adenocarcinoma, and 51 had an undefined form of cirrhosis. Of the 400 patients, 103 showed pleural effusion, and in most of these the effusion was due to a mechanical factor. The stasis, edematous alveolitis, and subsequent pleural transudation were associated with the rising of the diaphragm and the pressure of ascitic fluid on the pulmonary bases. In only 5 of the 103 patients was the pleural effusion of tuberculous origin.

INDIA

Electrical Activity of Muscles in Infantile Cerebrospastic Paralysis.—Fudel-Ossipova and Mezhenina (*Neurology*, vol. 6, January-March, 1958) stated that the electromyograms of affected muscles in infantile cerebrospastic paralysis show marked deviations from normal. The more pronounced the muscle spasm, the lower are the action potentials appearing in the muscle during voluntary contraction. Besides, the activity of the antagonist muscle at the same time is about the same as that of the functioning muscle. A prolonged disorder of the normal function of a muscle in spastic paralysis leads to pathological changes in its structure. The morphological picture of these affected muscles is characterized by numerous destructive changes. As the functional ability of a muscle will be affected by such destructive changes and as the electrical reaction of a muscle during voluntary contraction indicates its functional ability, the authors tried to find out whether a correlation exists between the electrical activity of spastic muscles and the morphologic changes found in them.

They studied 36 patients with infantile cerebrospastic paralysis between the ages of 5 and 16 years. While studying the electrical activity of spastic muscles, electromyograms of the antagonists were also recorded. A biopsy specimen of the affected muscles was also taken. Eight of these patients had a mild degree of spasm, 20 had a moderate degree, and 8 were severely affected. A definite correlation was noted between the extent of destructive changes in the morphologic structure of a muscle and its electrical activity. The milder the morphologic changes, the higher the action potentials appearing during voluntary contraction and the closer the resemblance to a normal electromyogram. When the pathological changes were advanced, as in patients with severe spasm, the electrical activity was reduced to a minimum and their function was restricted. With marked changes in the structure of a muscle, transplantation of its tendon will not give the desired effect. Preoperative electromyograms would thus help to ascertain the functional potential of a muscle and thus help in selecting a suitable transplant.

Carcinoma of the Breast.—D. G. Reddy and coworkers (*Indian Journal of Medical Sciences*, vol. 12, April, 1958) studied a series of 681 patients with carcinomas of the breast. Breast cancers formed about 8% of the total malignancies in both sexes. The youngest patient in the series was 17 years old and the oldest 70 years, the maximum incidence being between 30 and 50 years of age. About 10% occurred below the age of 30. About 1.5% of all breast cancers occurred in men; 53% of the tumors were in the left breast, and the upper outer quadrant was the commonest site. Multiparity and breast feeding did not have any relation to the development of these cancers among the women. The commonest variety was the scirrhous type (76%). Infiltrating comedocarcinomas formed 8%, papillary carcinomas 4.5%, medullary carcinoma with lymphoid infiltration 8.5%, and colloid carcinomas 2%. Only two cases of Paget's disease were seen with the characteristic changes in the nipple and an intramammary growth.

Study of Plasma Proteins.—B. S. Kulkarni and coworkers (*Journal of Postgraduate Medicine*, vol. 4, April, 1958) examined the plasma proteins by electrophoresis in 187 subjects between the ages of 18 and 50 years who were taking vegetarian and mixed diets. All the subjects were healthy and well nourished. In the last two-year period before taking their blood samples, they had not suffered from any pathological disorder; 136 were men and 51 women; 152 were between 18 and 30 years of age, 24 between 31 and 40 years, and 11 between 41 and 50 years; 72 took a vegetarian diet along with milk and milk products and 115 ate a mixed diet including milk, eggs, meat, fowl, or fish. The total protein content of the plasma was about the same as reported by Western authors. The albumin level was also the same; the values of alpha 1, alpha 2, and beta globulins, though slightly lower, were comparable to those obtained in the West, but the value of gamma globulin was slightly higher. The cause of this high level is not clear. The total proteins were slightly less in women as compared to men, and this was due to the low value of albumin; this difference was not, however, statistically significant. With increasing age, the levels of total proteins and of beta and gamma globulins showed a progressive rise but those of alpha 2 globulin and fibrinogen showed a fall. A statistically significant difference was noted only in the value of gamma globulin. The total proteins were slightly higher in those taking non-vegetarian diets but this difference was not statistically significant.

Right Heart Catheterization.—K. K. Datey and coworkers (*Journal of Postgraduate Medicine*, vol. 4, April, 1958) catheterized the right heart of 30 cardiac patients (23 with congenital and 7 with acquired heart disease). Three patients with pulmonary stenosis showed a right atrial pattern in the electrocardiogram with large "a" waves and the "c" wave being represented by a small hump on the descending slope of "a" wave; elevation of right ventricular systolic pressure depending on the degree of stenosis; normal or diminished pulmonary arterial pressure (in one case the pulmonary arterial pressure was slightly higher, probably due to the development of slight pulmonary incompetence following an attack of subacute bacterial endocarditis); and an infundibular or combined infundibular and valvular pattern in the pressure gradient across the pulmonary valve. Both systemic and pulmonic blood flow were equal but diminished while the arteriovenous oxygen difference was always over 5 ml. per 100 cc. Six patients with the tetralogy of Fallot and one with the pentalogy of Fallot were studied. The catheter could be passed into the aorta in four. There was elevation of the systolic pressure in the right ventricle, the pulmonary arterial pressure was low, and the tracing often deformed. There was a pressure gradient across the pulmonary valve. The systolic blood flow ranged above or below the normal value and the pulmonary blood flow was reduced. The arterial oxygen saturation ranged between 67 and 87.5% and in one patient it was 92%.

Of three patients with patent ductus arteriosus, one had an atrial septal defect and probably a ventricular septal defect. These showed a greater oxygen content of blood samples from the pulmonary artery than that from the right ventricle; greater pulmonary blood flow as compared to systemic blood flow, the ratio varying between 1:1.5 and 1:3; normal pulmonary arterial pressure; and in some the catheter could enter the aorta through the patent ductus. Three patients with atrial septal defect showed elevation of the right atrial pressure and also of the right ventricular and pulmonary arterial pressure. They also showed increased oxygen saturation in the right atrial samples of blood while the catheter could enter the left atrium, left ventricle, or pulmonary vein. Patients with mitral stenosis showed elevation of the pulmonary arterial wedge pressure, pulmonary arterial pressure, right ventricular pressure, and right atrial pressure. In those with constrictive pericarditis the right atrial pressure showed marked elevation and the right ventricular pressure curve showed slight elevation of systolic pressure. There were no deaths in this series. Minor complications were seen in a few patients. Thus occasional ventricular extrasystoles occurred in almost all patients and one developed a short paroxysm of ventricular tachycardia. Right bundle-branch block was seen in two patients; in one it was transient and in the other it disappeared within five minutes of withdrawing the catheter into the superior vena cava. Venospasm occurred in three patients and pyrogenic reaction in four of those catheterized early in the series. Autopsy performed on four postoperative patients within a month of cardiac catheterization did not reveal any traumatic lesions on the endocardium. Local thrombophlebitis developed in five.

Toxigenicity of Corynebacterium Diphtheriae.—Soman and Patel (*Indian Journal of Medical Sciences*, vol. 12, April, 1958) compared the method of intradermal inoculation of guinea pigs used as a standard procedure for determining the toxigenicity of Corynebacterium diphtheriae with the in vitro plate method and the chick-embryo inoculation method. Nasal swabs and throat swabs were collected from patients suspected of having diphtheria and from suspected carriers. After making direct smears and culturing and typing, the culture was tested for its biochemical and hemolytic activity and tested by the three methods for toxigenicity; 120 cultures were thus isolated and 110 tested for their biochemical properties, of which 3 turned out to be the gravis and 107 the mitis type. On typing 45 strains on tellurite agar plates, 3 were found to be the gravis, 3 the intermedius, and 104 the mitis type. Eighty-nine cultures were subjected to the standard virulence test in the guinea pig, the in vitro method, and the chick-embryo inoculation. The results with all three showed perfect agreement. As the in vitro method is rapid and cheap it can be used in small laboratories where guinea pigs and eggs are not freely available. The diphtheria antitoxin used in this test should be properly selected and used in proper concentration to get clear results. This method being simple, economical, and reliable as compared to the other two may be accepted as a routine procedure for the determination of toxigenicity.

Succinic Dehydrogenase in Human Spermatozoa.—Kothare and De Souza (*Journal of Postgraduate Medicine*, vol. 4, April, 1958) described a method of demonstrating succinic dehydrogenase cytochemically using p-nitrophenyl substituted ditetrazole in mature normal, immature, and abnormal spermatozoa occurring in the semen of normal healthy men. The enzyme was localized on or in the vicinity of the mitochondria and was concerned in the vital metabolism of the cells. The semen was treated with buffer substrate tetrazolium solution and the enzyme was demonstrated as fine discrete blue granules. In normal adult spermatozoa they were localized in abundance over the midpiece with a slight condensation at the margins. In an abnormal form with a large head with two distinct nuclei and abundant cytoplasm, an occasional granule was seen in the head. Faint granules in the head and body were seen in pin head sperms and a few of these were devoid of granules. Variable patterns were seen in ring-tailed sperms with faint granules in the head or no granules at all. An occasional sperm with a double head and double body showed a concentration of the enzyme in the midpiece. Sperms with a cytoplasmic membrane around the neck and the midpiece showed variable amounts of succinic dehydrogenase in the membrane. Most showed a few fine granules in the head. This cytochemical method would help in the study of the morphology of spermatozoa, especially in their progress to maturity.

SRAEL

sia Influenza.—The experience of the virus laboratory of the Hebrew University–Hadassah Medical School in the diagnosis of influenza during the outbreak of Asian influenza between October, 1957, and January, 1958, was reported by A. Bernkopf in *Harefuah* (55:288, 1958). From 131 specimens submitted for virus isolation, 37 strains of influenza virus were isolated. The highest percentage of isolations was obtained from throat washings (38%). Next highest was the percentage of virus isolations from lung material (27%). Less satisfactory was the percentage of isolations from sputum (18%). Bacteria resistant to penicillin and streptomycin were isolated from 19 specimens, 10 of them lung material. Two of the lung specimens contained resistant staphylococci. In the other patients resistant Klebsiella, Pseudomonas aeruginosa, and Escherichia coli were present. Antigenically, all influenza strains were homogeneous and were inhibited specifically by A/Singapore/1957 antiserum. Serologic diagnosis was based on the rise of antibodies as determined by the hemagglutination inhibition or, more rarely, the complement fixation test. Though less specific, the latter test was found to be highly sensitive. For the hemagglutination inhibition test, use of a high egg passage strain and inactivation of the nonspecific inhibitor in serum by cholera filtrate were found important. Treatment of serums with trypsin or periodate was less satisfactory. It was repeatedly observed that antibody production as measured by the hemagglutination inhibition or complement fixation test was delayed, or only small amounts of antibody were produced. In a few cases in which the diagnosis of influenza was highly probable on both clinical and epidemiologic grounds, no rise of antibody level could be demonstrated. These findings may be explained by the complete novelty of the Asian strains of influenza which differed in their antigenic composition from all strains previously encountered.

Blood Groups in Sephardic Jews.—The ABO, MN, and Rh-Hr blood group frequencies in Sephardic Jews were reported by J. Gurevitch and co-workers in *Harefuah* (54:293, 1958). In the ABO system the frequency of group A was relatively high and the frequency of the phenotype O low. The *M* and *N* genes were evenly distributed, but the Sephardic Jews exhibited an interesting, though unexplained, heterosis in that the phenotype MN (70%) far exceeded the expected 50%. In the distribution of the Rh-Hr chromosomes the high frequency of the Mediterranean CDe (R_1) chromosome—characteristic for all Jewish communities so far examined—was found. The cde and cDe chromosomes were relatively frequent, indicating the possibility of an African and Spanish admixture.

Hemolytic Trait in Oriental Jews.—A metabolic abnormality of erythrocytes was detected in all patients with favism and hemolytic reactions due to drugs, as well as in a large proportion of members of their families, by Szeinberg and Sheba (*Harefuah* 54:285, 1958). The abnormality was detectable even in the umbilical cord blood. In a large-scale population survey no subjects with this abnormality were found among Ashkenazic Jews, while about 20% of non-Ashkenazic Jews originating from Iraq or Persia, 5% of Yemenites and immigrants from Turkey, and 2% of North African Jews were found to be affected. Similar findings were detected also among non-Ashkenazic Jews from Greece, Egypt, and Sudan and in a small percentage of Arabs from the central part of Israel. Genetic studies suggested that the abnormality is hereditary and probably transmitted by a sex-linked, incompletely dominant gene with variable expressivity. The transient glutathione instability of newborn infants during the first hours of life differs from this condition, as it is not hereditary, is not racially determined, is not connected with deficient glucose-6-phosphate dehydrogenase activity, and may be corrected in vitro by addition of glucose or inosine to the blood.

Drug Resistance in Shigella.—About 50% of Shigella strains isolated in Israel were found by G. Altmann and co-workers to be resistant to sulfadiazine. While chloramphenicol proved to be the drug of choice in the treatment of bacillary dysentery until 1955, 19% of a series of Shigella isolated in 1956 were found to be resistant to chloramphenicol and 17% to tetracycline. In 1957 the percentage of strains resistant to chloramphenicol rose to 24% and of those to tetracycline to 35%. All strains tested proved to be sensitive to polymyxin B and neomycin. A number of cases of shigellosis caused by resistant strains followed a severe and protracted course, and some of them ended fatally. Using the rapidity of disappearance of Shigella from the stools as therapeutic index, a significant difference was noted between sensitive and resistant strains. The need for planned treatment of bacillary dysentery was stressed in the light of these findings.

NEW ZEALAND

Control of Extradural Hemorrhage.—Dr. R. G. Robinson (*Australian & New Zealand J. Surg.* 27:303, 1958) reported that in some patients the control of bleeding from extradural hemorrhages may be difficult. Recurrences have been reported. In a series of 16 patients with extradural hemorrhage treated surgically, 5 died. There was an appreciable reaccumulation of clot which partly contributed to the fatal issue in two of these. In another patient, the wound had to be packed with gauze before the bleeding could be arrested. In two of the author's patients hemostasis proved unusually difficult. One was a woman who had fallen off her bicycle. Neurological symptoms appeared a few hours later. A left temporal bur hole was made under local anesthesia and a huge extradural clot was removed. There continued to be a diffuse vascular oozing from the dura and many of the bleeding points were inaccessible owing to the posterior extent of the dural stripping. An osteoplastic flap was the only way of getting at the vascular weeping from the dura. The patient regained consciousness five hours after the operation and made a good recovery. The use of an osteoplastic bone flap in extradural hemorrhage has been a matter of controversy. Arresting the diffuse vascular oozing from the dura is admittedly difficult but many of these difficulties are due to a failure to close the dead space left by the evacuated hematoma. The use of an osteoplastic flap has the merit that it allows hemostasis of the exposed dura. The dead space may then be reduced by stitching the dura up to the surrounding tissues. The disadvantages of a flap are that specialized instruments are needed and the restless state of the patient may make the procedure difficult even for the expert.

Recently Dr. Robinson has used another method which is simple and promises to overcome these difficulties. A 14-year-old boy who had been kicked in the head presented neurological symptoms. Under local anesthesia a conventional left temporal bur hole was made and enlarged, and numerous bleeding points were sealed with the diathermy. Four hours later there was a massive recurrence of the extradural hematoma. The dura persistently oozed. Division of the middle meningeal artery at the foramen spinosum made no difference in the bleeding. A small nick was made in the dura and Ringer's solution was injected into the subdural space. The dura showed no signs of staying expanded and the incision was closed with a stitch. A lumbar puncture was made and 40 ml. of Ringer's solution was injected into the subarachnoid space. The dura came out into tight contact with the skull and the bleeding ceased at once. The wound was closed over a soft rubber drain. The patient improved rapidly and the drain was taken out on the next day but there was no blood on the dressing. This was an uncommon case of recurrent extradural hematoma as there was no fracture of the skull and the major vessels were intact. The method of injecting isotonic sodium chloride solution or Ringer's solution into the subarachnoid space after the clot has been removed is effective because it expands the compressed brain and closes the dead space, reduces the tentorial herniation, and counteracts any intracranial hypotension. If the dural oozing persists after the control of the major vessel or when the dead space is not obliterated by the expansion of the brain, enough isotonic sodium chloride solution should be injected into the lumbar subarachnoid space to overcome these difficulties. It is unlikely that more than 100 ml. will be needed and at the worst no harm is done. Only in failure of this simple method should the use of an osteoplastic flap be considered with its requirement of a general anesthetic. There is no place for gauze packing or ligature of the external carotid artery in these troublesome cases.

Nontuberculous Empyema.—Dr. James A. Baird (*Australian & New Zealand J. Surg.* 27:313, 1958) reported that empyema of the pleural cavity has increased in incidence in the past two or three years. Following the introduction of the sulfonamides and penicillin in the treatment of pneumonia, pleural complications became uncommon, but due to antibiotic-resistant staphylococcic infections their incidence is increasing. The aims of the treatment must be the sterilization of the pleural cavity and the return of the hemithorax to normal, i. e., the complete expansion of the lung and the restoration of the normal movements of the chest wall and diaphragm. Of a *series of 32 patients seen in the* past five years, 27 have been seen in the past two years. The treatment of pleural suppuration must be vigorous, consisting of frequent aspirations of the fluid with the instillation of the appropriate antibiotic and proteolytic enzymes as required. Thoracic physiotherapy must be instituted early. Radiographic control is essential.

Failure to obtain progressive reexpansion of the lung is an indication for surgical treatment. Intercostal catheter drainage is the treatment of choice in infants and the elderly and in small loculated empyemas. All other empyemas are best treated by excision. This has been practiced in 14 patients without any deaths. It has been stated that this operation should not be practiced in less than eight weeks from the onset of pleural infection and that the disadvantages of the operation are the possibility of a residual empyema pocket requiring drainage and the recrudescence of the infection. Neither of these complications is likely to occur if the operation is performed within four weeks of the occurrence of pleural suppuration. At this stage the tissues are still mobile and space obliteration occurs rapidly after excision. Early operation avoids the necessity for mutilating flap operations on the chest wall to close infected dead spaces associated with late empyema. Furthermore blood loss is less with early operation. Other advantages are primary healing, the patient is fit for discharge two or three weeks postoperatively, and the source of toxemia is promptly removed. It has been maintained that because excision is a severe procedure, it should be reserved for selected patients such as those with total empyema. It cannot be denied that excision is a much more serious operation than rib resection but it has been shown that it is safe and that the convalescence is much shorter.

NORWAY

Poliomyelitis Vaccination.—In *Tidsskrift for den norske lægeforening* for May 15 Dr. Evang stated that the Norwegians have experimented with both intracutaneous and subcutaneous injections of poliomyelitis vaccine, the subcutaneous dosage being 1 ml. In cooperation with the Danes, who have consistently given their vaccine intracutaneously, the Norwegians in the autumn of 1957 compared the effects of both methods on medical students in Oslo. The antigen response after two injections given by one or the other method was compared, and though neither emerged from these tests as definitely superior, the subcutaneous injections of 1 ml. appeared to give slightly better results. Directions were therefore given to use this method, and the experiments on medical students have continued. Vaccines made in the United States or Denmark were used.

The Hearing of School Children.—The systematic examination of the hearing of school children in Oslo began in 1919. What these examinations have achieved is reported on in *Tidsskrift for den norske lægeforening* for June 1 by Dr. R. Moe, whose figures are mostly concerned with two groups, one composed of children observed in the school years 1948-1949 and 1955-1956 subjected to a follow-up examination and the other of more than 2,000 children screened in the winter of 1957. Audiometry has been adopted as the routine method of testing since autumn, 1957. Since 1950 all children with impaired hearing have had pure-tone audiometry, and since 1947 every such child has been kept under observation until his hearing became normal or until maximal improvement was obtained. Of the 44,784 children examined between 1948 and 1956 3,170 (7%) were found to have impaired hearing. On the final check-up, of 90.5% of these children, 69.2% were found to have regained normal hearing, 12.1% were improved, and 18.7% were unimproved or worse. In 69 children (0.15%) the loss of hearing was so severe that teaching had to be given in a separate school for children with defective hearing. Of the 37 children in such a school in 1957 there were only 2 with conduction deafness, the other 35 suffering from perceptive deafness.

In the past four years all the children found to have impaired hearing in their first year at school were retested in their final year, when it was found that 70.6% had regained normal hearing, 10.3% were improved, and 19.1% were unimproved. In the winter of 1957 audiometry was carried out on the 2,123 children in the fourth grade who had been tested in the first grade. Of these, 6.1% had impaired hearing while in the first grade, and 4.4% while in the fourth grade, while only 2.2% had impaired hearing on both occasions. Impaired hearing due to middle-ear disease incurred in the preschool years was discovered in 1.6% of the children in their first year at school. Similar sequelae without impaired hearing were found in another 1.6%. Moe concluded that the presence of some chronic adhesive lesion or sequelae of otitis in over 3% of the children at the age of 7 emphasized the need for preschool prophylaxis, with adequate treatment of acute middle-ear disease early in life.

UNITED KINGDOM

Causes of Overweight.—At the annual meeting of the B. M. A. in Birmingham, girth control was advocated by Dr. H. M. Sinclair, of Oxford University, an authority on human nutrition. It could in part, he said, be the answer to the growing amount of degenerative disease. Cardiac and other diseases may be attributed to a deficiency of the fatty acids that are essential to the body. Cow's milk and butter are deficient in these acids. They supply the wrong fat. Giving children unlimited food, especially milk, produces early maturity, a certain amount of obesity, and chronic degenerative diseases later. In general, the Eskimo child, although fat, is in better health than the typical American child.

We need a particular type of fat in our diet, but the more we process food the less of it we get, because processing destroys the essential unsaturated fatty acids. The Eskimo child naturally consumes large amounts of highly unsaturated fats of the right type; but we send a bus to take a child a quarter of a mile to school, where he is given large amounts of milk before he returns home to sit in front of a television set, perhaps smoking a cigarette. If he survives and gets into industry, he becomes less and less active as more and more machines do the work, again giving him more time to smoke. Dr. Sinclair does not believe that there is a direct connection between these degenerative diseases and smoking but that the associated lack of physical exercise and improper nutrition are the determining factors. He described the national "Drink more milk" campaign as pernicious. Excessive body fat represents a waste of food and a danger to health.

Cold Babies.—At the same meeting Dr. Trevor Mann of Brighton said that more than 100 babies up to six weeks of age die of cold in a year in Britain. In five years he had seen 15 cold babies, 8 of whom died. Their average body temperature was 90 F (32 C), but one baby had a temperature of 74 F (23 C) or 24 degrees (F) below normal and died five days after admission to hospital. These babies did not look ill; they were pink and glowed. The condition occurred on the coldest days. Babies could die of the cold at a room temperature of 55 F. Bathing the baby in the winter is hazardous. The period of greatest danger is 2 a. m. when the mother and father are warm in bed and the fire has been turned out. Fires should not be allowed to go out at night when the baby is young. Dr. Hugh Ellis of Oxford called the condition "the refrigerator syndrome." He believes that factors other than cold are involved, because many babies get along well in a cold room.

Hospital Beds Still Scarce.—At the same meeting Dr. E. A. Gerrard, of Manchester, spoke of the public scandal of hospital waiting lists. In surgery there are four people waiting for every bed in the teaching hospitals in London and five in the provinces. In gynecology the position is worse. There are nine patients waiting for every bed. Patients with nonurgent cases in all parts of the country must wait three to four years. One reason for this is miscalculations at the start of the National Health Service, but the planners are not the ones who must wait two or three years for an operation. It is the ordinary people. A motion urging prompt building of new hospitals was carried.

Medicine's Curtains of Mystery.—Dr. James Robertson Justice, Rector of Edinburgh University, better known, perhaps, in his role as a film actor, made a plea for the abolition of mystery in medicine when he gave this year's Winchester address in June. He praised the "closed shop" in medicine insofar as it upheld the rigorous standards of conduct, but he felt that medicine, an empirical science, tended to be too esoteric, to share its mysteries only with the initiated, and to assume that it was bad for a patient to know too much. This attitude was based on false premises. The speaker agreed that "popular medicine" was a horror to be avoided at all costs, but he believed that the medical profession should cease to take refuge behind the archaic curtains of mystery. People had come to take medicine for granted, and if this were to be corrected it would be necessary for physicians to take patients more completely into their confidence. He objected not only to the conspiracy of silence but to the attitude that suffering was somehow linked with sin and that an ability to endure pain was a sign of merit.

Action on Nazi Camp Doctor.—Action has been started to deprive Dr. Herta Oberheuser, former Nazi concentration camp physician, of her right to practice medicine at Stocksee, North Germany. This news was heard with satisfaction by the British Medical Association at its annual meeting. Oberheuser was a fanatical young Nazi who volunteered for service at the notorious Ravensbruck concentration camp for women, where sadistic experiments were made on prisoners. When she and other physicians were tried at Nuremberg, in 1947, evidence was produced that she selected the victims and assisted in the experiments. She was sentenced to 20 years imprisonment but was released in 1952. She was treated as a returned prisoner-of-war. She received a payment and an interest-free loan to resume practice. Two other reinstated physicians were Hans Eisele, who was at Buchenwald camp, and Hans Bodo Gorgass, whose euthanasia experiments involved 1,000 victims in a mental hospital. The evil done in these camps has not ended. Even now many concentration camp survivors shrink from the simplest and kindest examinations. The opinion was expressed that it is our duty to protest that doctors such as those named should never be allowed to practice medicine again since what they have done is a violation of the very basis of medical practice. Although in Germany a doctor receives permission to practice from the state, which alone may take it away, in the Oberheuser case, the Chamber of Doctors of Schleswig-Holstein and the Federal Chamber of Doctors have both sought the withdrawal of Oberheuser's right to practice. The Ministry of the Interior has started proceedings for such a withdrawal. The German medical profession hopes that the right to practice medicine will be taken away from Dr. Oberheuser.

The B. M. A. meeting carried a motion expressing deep distress that the German authorities permitted Oberheuser's reinstatement. A spokesman for the Schleswig-Holstein Ministry of the Interior said that an investigation into the case began last year. It was not known when it would be completed. Dr. Oberheuser will have to be heard first. A representative of her local medical council said that if only part of the accusations against her are true she should be considered unworthy to be a doctor. People at Stocksee, the village where she practices, however, are reported to regard her as a good doctor and are inclined to forget her past.

Broadmoor.—At Broadmoor, an asylum for the criminally insane, Frank Mitchell, an inmate who boasted that no prison bars could keep him incarcerated, succeeded in making his escape and was at liberty for two days. By so doing he placed in the hands of the Prison Officers' Association the strongest weapon it has had in a year-old battle between the nursing staffs of the institutions and the medical consultants. The battle has been fought round the following question: In the interests of the public and patients in the institutions, which patients should have priority, security, or mental treatment? The prison officers wanted more locked doors. The psychiatrists insisted that if patients were to be treated satisfactorily they must have freedom. In 1948, the Criminal Justice Act transferred control of Broadmoor from the home office to the Ministry of Health. Behind the transfer was the enlightened policy of treating inmates as mental hospital patients rather than criminals. One patient's main delight was smashing windows. Twenty years ago this would have cost him time in the security block from which Mitchell escaped, but when male nurses placed the window-breaker in a room with iron bars in front of the glass, a psychiatrist protested that the atmosphere was wrong. "If he wants to smash windows let him," he ordered. "Glass is cheap. To restrict him will ruin his treatment." Petty pilfering among patients, punishable in the old days by seclusion, is now a subject for talks between psychiatrists and patients. After the escape of child-killer, John Straffen, the Broadmoor Inquiry reported in June, 1952, that the two main functions of the committee are detention and treatment. At one time, detention was regarded as primary and treatment as secondary, but during 14 years of management by the present medical superintendent, Dr. Hopwood, more and better treatment has been made available for patients. The prison officers' leaders now want control of the institutions given back to the home office.

Pay Increase to Physicians Refused.—The fight on pay between the government and the physicians flared up again at the annual meeting of the British Medical Association in Birmingham. Cries of "Shame" greeted an announcement that the Minister of Health had refused a further interim increase for 40,000 family and hospital physicians in the National Health Service. The physicians originally asked for a 24% increase, and when it was rejected they planned a phased withdrawal from the health service. The physicians were then awarded interim pay increases of 5 and 10%. When no further action was taken by the government by Easter, they claimed another interim increase to meet the further rise in the cost of living. The Minister's letter stated the following.

> The reasons why I am unable to agree that the circumstances warrant a further interim increase at the present time are broadly twofold. In the first place, although the Royal Commission are not yet ready to report, they are pressing ahead with all speed and, assuming that their report is not unduly delayed, a further increase would run the risk of prejudicing their work. Secondly, the economic situation of the country at the present time must be taken into account. Circumstances since April and May 1957 to date have not changed so greatly as to justify an increase. Moreover no other people remunerated from the public purse who received a pay increase of 5% in April and May 1957 have yet received any further award. A further award to the doctors might well lead to claims for increases in remuneration of an inflationary nature from others and it remains just as important as ever to secure stability in wages and salaries.

Dr. Wand, Chairman of the B. M. A. Meeting, said: "Whenever we go to the Ministry the economic situation is wrong. We are always told we have missed the boat. We are either too early or too late. This is the old story."

Merit Awards for General Practitioners.—In the supplement to the *British Medical Journal* of July 12, Dr. J. F. Burdon, a general practitioner, said that recent suggestions that general practitioners should receive merit awards of the type given to some specialists prompt two questions. How is merit to be judged? And is it not already rewarded? No single satisfactory method of determining merit in the general practice has been found, but the meritworthy general practitioner, who undoubtedly does exist, is not without consolation. He is being paid to keep his patients healthy. If he is more successful at this than the next doctor, he thus attends less illness and gains more leisure or is able to care for more patients. The increase of work in the preventive field costs him much less in time and energy than the illness he prevents would have done, and he derives happiness and satisfaction from his work—things which he could not buy with extra income. Such qualities as kindness and patience cannot be measured, judged, or priced; yet how meritorious is the physician who has them. Such merit seeks no reward in cash.

MISCELLANY

THE DOCTOR'S PLACE IN PUBLIC AFFAIRS

Mr. Speaker, under leave to extend my remarks in the *Record*, I include the following address given on June 12, 1958, at the commencement exercises of Jefferson Medical College in Philadelphia:

President Kaufman, members of the graduating class, and of the faculty, alumni, and friends of Jefferson Medical College, it is indeed a great honor and privilege to be invited to speak at these commencement exercises today.

No one ever worked harder to get his medical degree than I, and no one ever appreciated it more. Occasionally someone before introducing me to an audience will ask, "What shall I call you—Doctor? Congressman? Honorable? or what?" I usually reply, "Just call me Doctor. I earned that one, and I will have it after the others are gone."

You who have just received your doctor's degree will find that your alma mater has equipped you well with all that any medical school can give its students in scientific knowledge and technical skills. I have no concern regarding the excellence of your medical training, or the high quality of your professional abilities. If there is reason for concern, it is more likely to be with regard to the quality of your citizenship. For that must be of a higher order than my generation has demonstrated or there may not long be a society in which you will have opportunity to use with success and satisfaction the knowledge and skills you have worked so long and hard to acquire here.

Our profession is going through the latest of several transitions it has experienced in the last century. Originally, the doctor's main concern was with therapeutics. Since he didn't know too much about disease processes, it really amounted to treatment of symptoms.

Then Loeffler discovered the diphtheria bacillus and Koch the tubercle bacillus. Virchow and others began doing systematic autopsies systematically. It was proved that most symptoms were the result of demonstrable pathological processes in various organs. The doctor began to shift his attention from results to causes, from therapeutics to diagnosis, from symptomatology to etiology.

This was the period in which I was trained almost 40 years ago. It was called the era of therapeutic nihilism. We concentrated our attention so much on the disease that we almost forgot the patient.

Then, with better understanding of how diseases were caused and communicated, a third emphasis naturally developed—preventive medicine. The good doctor had to be an expert not only with the stethoscope and the microscope, but with the immunizing needle.

In more recent years there has been an increasing recognition of the effects of mind and emotions on physiological processes—and vice versa. The doctors who only took care of physiological processes were losing too many patients to those who paid attention also to people's emotions, and gave them something to have faith in. Psychosomatic medicine belatedly came into its own.

Now we have entered a fifth stage in this gradual metamorphosis—the doctor must give more attention to public affairs, or he will lose his professional freedom. During the depression of the 1930's, the hot war of the 1940's, and the cold war of the 1950's, our Government steadily expanded until it now reaches into everybody's life and everybody's pocketbook almost every hour of every day. How and under what circumstances you are to practice medicine, what you are able to earn, how much of what you earn you are permitted to keep, and what you are able to do with what you retain, depend more than ever before on what happens in Washington.

But what happens in Washington depends more than ever before on what happens in Algeria, or Venezuela, or Korea, or Lebanon.

What happens in those places depends on what somebody decides in the Kremlin or Peiping.

And what they decide in the Kremlin or Peiping depends to a greater degree than we realize, I think, on what we say and do here in the United States.

Nobody needs to be apologetic about discussing political issues today. For unless we handle our domestic affairs in such ways as to maintain sound government, there is no gain—medical, social, or otherwise—that will long be worth much to anybody.

And conceivably, we could solve all our domestic problems—we could have better medical care more equitably distributed; we could meet our housing needs, our education needs, and our old-age security and labor-management problems—but unless we manage our political and economic relations with the rest of the world better than we have, so that we can prevent too frequent wars and too prolonged and exhausting expenditures for defense, none of the domestic gains can endure.

Your generation of doctors must play a more active role in public affairs for at least three reasons:

Extension of remarks of Hon. Walter H. Judd of Minnesota in the House of Representatives, July 7, 1958.

First, in order to ensure your future as doctors; to safeguard the conditions under which you can use to best advantage your knowledge of disease and your skill in helping the sick. What you are going to be permitted to do as medical men depends on what you do as citizens.

Second, in order to work toward betterment of environmental conditions that affect adversely your patients. The man who comes to you with arthritis or hypertension frequently has something else wrong with him too. Perhaps he has a boy in Communist hands in East Germany; or his business is in trouble; or inflation is eating up his life's savings; or he is apprehensive about atomic fallout and sputniks. He knows his country is in deep trouble. He has legitimate anxieties. If you are really going to help him with his ulcers, or his insomnia, or his hyperthyroidism, you will have to pay more attention to the impact on him of his world environment, and get yourself into a position where you can influence that environment in the direction of conditions more favorable to your patient's well-being.

Third, you have to pay more attention to public affairs in order to ensure your future as citizens. Before any of us are doctors, or businessmen, or lawyers, we are citizens of this Republic. All of us are, or will be, taxpayers. Most of us are parents. All of us are trustees of a great and noble heritage of freedom—trustees of a political and economic order which made it possible for even those of you who came from humblest circumstances, as did I, to get the expensive education which we could never have dreamed of obtaining in most countries of the world.

What we know as doctors about the practice of medicine should and must influence our thinking and our activities as citizens. But our obligations as citizens must also influence our thinking and conduct as doctors.

For example, doctors, almost to a man, are opposed to socialized medicine—by which term I mean tax-supported medical services provided and operated by the Government. Most people, I fear, assume that we oppose socialized medicine because it would hurt the doctors. They think we are a closed-shop union that wants to have complete control of medical practice in order to promote our own selfish interests. We failed to show the public that our opposition to socialized medicine is not because it would hurt us, but because it would hurt the public.

As a matter of fact, socialized medicine wouldn't hurt most doctors financially. The superior doctor can get ahead under any system. The poor or even the average doctor would probably be about as well off financially under socialized medicine as under free competition. Furthermore, he wouldn't have to worry. He could get a fairly well-paid, Government-supported job right after internship and continue in it for the rest of his life.

So, it is not because we are doctors that we oppose socialized medicine; it is because of what we know as doctors about the practice of medicine.

The public has been taught to believe, by those who are more active in public affairs than we, that socialized medicine would give more and better medical care for less cost. Doctors know it would give less and poorer medical care for greater cost.

Doctors know that there are at least three essentials to good medical practice, all of which would be lost under socialized medicine.

First, the relationship between the patient and the doctor must be wholly voluntary on both sides. It has to be completely voluntary on the part of the patient, or she is not going to have full confidence in the doctor. It has to be completely voluntary on the part of the doctor or his heart is not fully in it. Under government management the relationship cannot be wholly voluntary. It is the patient who will suffer, not the doctor.

A second requirement is that there be complete privacy and no intermediary between the patient and the physician. When the doctor gets paid by the patient, the doctor works for the patient. When the doctor gets paid in part or whole by the government, then little by little he comes to work for the government. Again, the doctor may be better off, but God help the patient.

Under socialized medicine the government becomes an intermediary in another sense. Since public money is involved, a succession of clerks has to go through the records to see if the doctor did any unnecessary tests that ran up the bill. Somebody in a government bureau has to decide whether the doctor's diagnosis and treatment, and therefore his charges, were proper. In order to do that, the government employee has to read the patient's history. Most patients are not too eager to tell their doctor all the personal and private details that he needs to know in order to treat them properly, if the patient knows some bureaucrat is also going to be reading all those details.

What kind of care will the patient get with both his doctor and the government managing his case?

A third essential for good medical practice is that there be maximum incentives for the doctor to do his best, to get ahead, constantly to improve himself. One such incentive is financial reward in accordance with his ability and his effort. In every profession there are some individuals who have "self starters." Regardless of financial compensation or any other considerations, they give everything they have. But such persons are probably in the minority in our profession as in others. Most men work harder and do better if they believe that will get them ahead financially.

Another major incentive is professional recognition and advancement. You want the respect and confidence of your patients—and you will work hard to win it. But even more to be coveted is the respect of your colleagues. The most rewarding thing that can come to any one of you is to be known as a doctor's doctor. Some of you may be able to fool your patients with a high-powered personality and a smooth bedside manner, but you can't fool your colleagues. Other doctors will bring themselves or their relatives to you. only if you become really good.

Both of these powerful incentives—financial reward and professional recognition—are largely killed under governmental management where promotions are made on the basis of seniority—or, as it is sometimes called in Washington, senility.

What is necessary to get ahead under the bureaucratic system? The first essential is to live long enough. The second is to make no enemies. And what is necessary to make no enemies? The main requirement is not to have any new ideas. If it is a good idea, it makes your superior resentful—why didn't he think of it first? And he holds up your promotion. If it is a bad idea, that also reflects on him as your superior, and he holds up your promotion. So don't do your best to get ahead by hard work and creative effort—just conform. That is fatal in our profession as in every other.

All these things that we know as doctors make us oppose socialized medicine. But it is not enough for us to be right. We must tell and sell our reasons to the public far better than we have. We can't do that by just talking to each other at medical meetings. We don't need to convince each other. We have to reach the public and the politicians, not to put something over on them, but to help them understand the situation so that no one else can put something over on them.

But doctors must play an even larger role in public affairs. Who else can so well understand, and contribute so much to helping other citizens understand, the malignant nature of the Communist process which has spread its blight over one-third of the world and threatens the remainder, including our own free America. If we fail here, we fail everywhere.

For there is on this planet a conspiracy dedicated to our destruction. The heritage of freedom which enabled you to get where you are today, and will permit you to decide tomorrow where, how, and with whom you are to practice, and what organizations you are to join. ranging from medical societies to political parties—that heritage is under cold, determined, and increasingly successful attack on every front.

You know that the thing that makes a cancer bad is not its size or its location: it is the lawless way it grows. In practically all respects, the Communist movement behaves like every other malignancy. It has rejected the normal laws of growth, and expands by lawlessly encroaching on tissues that don't belong to it. Sometimes it is by direct invasion of an adjacent organ or country like Finland, Korea, Hungary. Or it extends more stealthily by metastases into other organs, transplants of lawless cells working within other countries to disrupt their economy, subvert their thinking, weaken their institutions, in preparation for take-over.

To deal successfully with the present malignant threat to our survival, how urgently our country needs the kind of mind which your medical college has given you.

First, the autopsy type of mind. You have been trained to study the mistakes of the past and admit them openly, in order to learn from them. The doctor does autopsies not to cover up, but to correct. In government, the prevailing rule is not to correct, but to cover up. Every summit conference to which we have gone since World War I without careful and thorough agreement on essentials, in advance, has led to disaster. Yet how many people in public affairs today. without your kind of mind, are urging our government to try once more the same pattern that has always failed.

We also need in public affairs more men with the biopsy type of mind. When you look through a microscope and see some abnormal cells that have broken through the basement membrane in violation of normal laws of growth, you don't say "Well, it's cancer all right, but it's down in the big toe. Let's wait and see if it spreads." You know it will spread unless you find ways to stop it at once and where it is. But during the last two decades, how many among our people said, "Isn't it too bad what Hitler is doing to the Jews, or the Japanese are doing to the Chinese, or the Communists are doing to the Hungarians? But after all those places are a long way off. Let's see if we can't persuade the lawless elements to confine their efforts to the ar [illegible] spread to us."

The doctor knows that in dealing with a malignant process, there can be no end to the struggle until one or the other prevails. That does not mean that we must drop bombs on it. It does mean that as a minimum we have to get and keep it isolated by cutting off its sources of supply, and its means of communicating its lawless cells to other areas. It means we must prevent its winning new victories, such as expanded trade or being received into respectable society, or diplomatic recognition would be.

While fighting the malignant process, the doctor knows that he must also build up the strength and health of the parts—the countries and the peoples—that are still free. We can't win by just outwaiting the enemy; we must outwork him.

You have been taught that almost the only unforgivable mistake for a physician to make is to underestimate the possible seriousness of a patient's complaint. If you overestimate it, you are guilty of nothing but a little undue caution. But if you underestimate it, the patient may be dead. The mistake is unforgivable because it is irretrievable.

Likewise, in the world struggle between lawless and law-abiding forces, it would be an unforgivable mistake to fail to understand the malignant character of the Communist new growth—or to underestimate its strength, its determination, the dangerous inroads which it has already made into the organs of our Nation and the thinking of our people, without their realizing it. We must not make that mistake ourselves—and it is our duty not to let our fellow citizens make it. Please God, we will all wake up to the seriousness of the threat before it is too late.

But there is another mistake we must avoid: We must not underestimate the strength of our own philosophy and faith—the basic soundness of the American system and its attraction and appeal to the oppressed millions of the earth.

What the world generally wants most from the United States is our wealth, our goods, our tools. But those are not what it needs most—for those are all results. What the world needs most from us is the secret that produced those results.

The secret of our wealth is an economic system which provides opportunity and incentive for men to get ahead, to create, to produce, to expand.

That economic system came from a political philosophy—the right of the individual.

That political philosophy, in turn, came from a religious faith—which put first the dignity and worth of every human being as a child of God.

We will not succeed in preserving the material results unless we revitalize and strengthen the spiritual roots from which they came.

In short, we shall have to demonstrate as strong and deep a faith in our faith as the Communists have in theirs—and we shall have to work as hard and as skillfully to spread the truth as they work to spread their falsehoods.

We must work both as individuals and as members of groups which we join and support because they are dedicated to the causes in which we believe—religious groups, civic groups, political groups.

So often one finds doctors unwilling or too preoccupied to work in political organizations. Yet if you are to expend your influence in public affairs, you must participate in politics, for politics determines government—and government today determines the conditions of your lives.

Therefore, join up with the political party that you think is nearest right on the most important issues. You won't agree with it on everything, any more than you agree on every issue with your fraternity, or your medical society, or even with your wife. But you don't pull out of those associations whenever you disagree. Rather, you try to move them in the direction you believe is right.

Just so, associate yourself with the party with whose principles and programs you find yourself in closest agreement, and work in and through it to select, and then to elect, good men and women to public office at every level of government.

In addition, more doctors have to be willing to be candidates for public office. That's tough, I can testify. But both patriotism and good sense require that all of our citizens, no matter how specialized their training, be willing to sacrifice their careers to go into public service in peacetime, just as their sons are called upon to sacrifice their careers to go into the armed services in wartime.

Only as we do these things—not just discuss them, but act—will there be hope. The most wonderful thing about our country, the thing which we must preserve at all costs, is the privilege we have of changing the things we don't like. Thank God our system is such that whenever conditions are bad, or don't meet our standards, we can correct them—if we will work in public affairs.

The way to begin is with ideas and principles, then get persons and parties committed to them, translate them into programs, and put them into practice.

Please don't think I am trying to lecture you today or imagine I have all the answers. Rather I am appealing to you for help. This world patient is too sick to be cured without the intelligent and dedicated effort of all of us. It particularly needs the leadership of men and women who have the qualities of mind and heart of the good physician.

The tests ahead will be harder than those you have just completed. But who is so well equipped to mold the attitudes and actions of our people as you who leave the classrooms and clinics of historic Jefferson Medical College today to take up your roles throughout our land as doctors, as citizens, as trustees—strong, well trained, confident, competent.

I congratulate you, your families, the communities into which you go—and our country.

THE LEISURE CORNER

MOTORING

Doctors, particularly those in nonmetropolitan areas, often spend as much as half their time behind the wheel of their cars. Few, however, will say that they regard driving, in its routine everyday sense, as a pleasure. Vacation driving is something else. Like everyone else, the doctor looks forward to the temporary escape from professional problems and personal vexations, and, although it adds to the already abundant mileage recorded on the speedometer, one might advance the proposition that vacation driving can be fun. Whatever its other consequences, the automobile has enabled us to see, in a short period of time, many scenic wonders an earlier generation could not know. Can driving be anything but a pleasure as one motors down route 20 in upstate New York and looks out over the green expanse of the Mohawk Valley? Or perhaps the physician will find himself this summer on the picturesque coastal road that links Los Angeles with San Francisco. There, to his left, overlooking the Pacific, he will see the jagged cliffs of Monterey Peninsula and, to his right, the breath-taking sight of multicolored flowers growing wild along the road; yet, it is the rare motorist who regards all vacation driving as fun and frolic.

There is the ubiquitous careless driver, darting from lane to lane without bothering to use hand signals and the highway jam-up in which one inches along bumper-to-bumper, threatened by a hissing radiator; and who has not, at one time or other, joined with Ogden Nash to lament: "I think that I shall never see a billboard lovely as a tree. Indeed, unless the billboards fall, I'll never see a tree at all."

There is another possible deterrent to pleasurable driving which is too often overlooked, and doctors, strangely enough, are as derelict about it as the next man. Like the shoemaker's daughter wearing the worst possible shoes, doctors often tend to forget the elementary principles involved in lessening driving fatigue. A common cause of accidents, fatigue is one of our most subtle highway killers. Ask a physician what he would do if he felt listless while driving, and chances are he would say that he would pull over and rest, but put the same doctor to the test on the highway, and, more often than not, he becomes the "average" motorist, eager to "get there" and willing to exceed his physical endurance to do so. He will succumb to the dubious lure of roadside hot-dog stands in a way that would arouse his fury if one of his patients showed the same lack of "moderation." Fatigue, a symptom the average physician encounters every day, has also engaged the attention of other groups. Reports by the Eno Foundation, the American Automobile Association, and the U. S. Public Health Service have all confirmed its importance in highway accidents. Experiments at Cornell University focused on the special question of proper seating. They revealed the importance of sufficient elevation to give the driver a proper command of the road.

Another study on seating conducted by the Market Forge Company of Everett, Mass., uncovered the fact that drivers who were given automobile seats designed for postural support were much less fatigued after sitting at the wheel for a number of hours than drivers using the accustomed deep soft seats put out in Detroit. On the basis of this study a posturally correct automobile back-aide with adjustments to fit it to individual body contours has been produced. As already suggested, periodic rest, proper diet, and correct seating are methods of counteracting driving fatigue that are well known to doctors, but there are other less obvious techniques for avoiding the fatigue hazard. Chewing a great wad of gum, for example, may seem a bit indelicate to one's vacation companions, but truckers and taxi drivers find that it's an inexpensive antidote. The fatigue induced by "highway hypnosis," the special bane of superhighway motorists, can also be controlled. Experienced commercial drivers recommend moving one's eyes about often instead of keeping them in a fixed stare. This requires a concentrated effort which militates against fatigue.

Driving can also be tied in with the pleasant pastime of singing to keep drowsiness at bay. The lost art of conversation might also be dusted off, both for its inherent value and for its special benefit in keeping the vacation traveler alert. Of the 28 million Americans who are driving the nation's highways this season, a fair percentage are doctors. Those who seek out the pleasures of motoring and who accept the responsibilities will find it a rich and rewarding experience. They will return from their sojourns with minds and bodies refreshed, once again ready to serve their fellowmen.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Rheumatic Carditis Following Commissurotomy for Mitral Stenosis. I. S. Golubev. Klin. med. 39: 73-79 (May) 1958 (In Russian) [Moscow].

The author reports a follow-up on 27 patients who were operated on for mitral stenosis of rheumatic origin. The period of observation varied from 6 to 26 months. Active rheumatic carditis before the commissurotomy was suspected in 2 patients. The rest of the patients presented no signs of active rheumatic process. Histological studies of tissue from the left auricle, however, revealed in 13 patients the presence of fresh Aschoff nodules. Apparently, rheumatic carditis in 11 patients was undetected. The operation caused exacerbation of the carditis in 2 patients in whom the rheumatic process manifested itself in a definite clinical picture. None of the patients who were operated on developed recurrence of the mitral stenosis. The postoperative course of patients with active, but not detected, rheumatic carditis was not worse than that of patients who did not have signs of active rheumatic carditis. The operation of commissurotomy resulted in pronounced improvement in 28 patients. In this group there were 11 patients with undetected rheumatic carditis.

Studies on Influenza: Experience with the Far East Strain. E. De Maeyer, P. Denys and P. De Somer. Acta clin. belg. 13:109-124 (March-April) 1958 (In French) [Brussels].

At regular intervals new strains of type A influenza virus, immunologically distinct from the previous ones, strike unprotected populations. This past year a new strain—the Far East strain—appeared, which rapidly invaded the whole world. After a general survey of influenza, the authors present their experience with the type A/Singapore/1/57 virus. 1. The inoculation of material obtained at the beginning of the disease permitted the isolation of the virus in 12 out of 14 patients. Between the 5th and 10th days of illness the isolation was successful in only 1 patient out of 4. Several successive fatal cases were observed. In 1 patient with influenzal encephalitis the virus was isolated from the autopsy material. This could indicate the acquisition of neurotropic properties by the influenza virus. 2. The evolution of the antibody titers was followed by the complement-fixation and hemagglutination-inhibition tests. A significant rise in the antibody levels was generally noted in convalescent individuals. Hemagglutination-inhibition antibodies attained a mean titer of 1:320 between the second and the third week after the beginning of the disease. This titer was lowered to 1:80 after the 10th week. 3. An experimental vaccine was prepared on chicken embryos. The virus was precipitated by the addition of protamine sulfate. The virus-sulfate mixture was washed several times, suspended in a phosphate-buffered solution, and finally inactivated by formol. The titer of this vaccine was 1:320, and its nitrogen content was 50 mg. per liter. 4. When it was administered to 1,000 individuals, the vaccine caused mild allergic reactions in 5% of the patients. Determinations of antibody levels were made 8 or 9 days after vaccination. By mixing different dilutions of serum with different dilutions of virus, it was shown that the complement fixators were parallel to the neutralizing antibodies. These mixtures were inoculated in the allantoid cavity of chicken embryos. The serum of vaccinated subjects gave a protection as good as that given by the serum of convalescents.

Osmotic Diuretic Treatment of Refractory Edema. L. M. Bernstein, B. Blumberg and M. C. Arkin. Circulation 17:1013-1020 (June) 1958 [New York].

Six patients with refractory edema, caused in 2 by congestive cardiac failure, in 2 by nephrosis, and in 2 by cirrhosis, were given intravenous injections of large doses of mannitol to test the effectiveness of osmotic diuretics in edema refractory to other diuretic therapy. The drug was given in doses varying between 100 and 475 Gm. in 8 hours. Whatever the previous levels of sodium, chloride, and water excretion, the administration of mannitol markedly increased those levels of excretion. Combined administration of mercaptomerin (Thiomerin) and mannitol was much more effective than either alone in increasing excretion of sodium up to 660 mEq. per day and water up to 8,685 cc. per day and in causing weight (edema) losses, whether the edema

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was of renal, cardiac, or hepatic origin. Weight losses which were negligible to very large occurred. being determined by both excretion and simultaneous intake. Diuretic responses were not necessarily accompanied by clinical benefit. The excretions were not accompanied by clinically significant alterations in serum electrolyte concentrations.

These data demonstrate conclusively the ability of an osmotic diuretic to markedly increase the urinary excretion of water, sodium, and chloride in patients with refractory edema. The increased effectiveness of the combination of an osmotic and a mercurial diuretic probably can be explained by their known different actions. Mannitol, by its water-retaining and sodium-diluting action, decreases the numbers of sodium-absorbing sites of the tubular cells that are exposed to sodium; mercaptomerin reduces the avidity of each of these decreased numbers of sites for sodium resorption. The combined effects result in great proximal tubular rejection of sodium and accompanying anions. The mannitol infusion caused pulmonary edema during the osmotic diuresis in the 2 patients with cardiac edema; this hazard must be recognized, and it may be minimized by use of adequate doses of urea or other osmotic diuretics that are distributed throughout body water rather than extracellular fluid alone. Marked diuresis was followed by early signs of central nervous system symptoms of hepatic insufficiency in 1 of the patients with cirrhosis. In 1 patient with Laennec's cirrhosis and in 1 with the nephrotic syndrome of lupus erythematosus, diuresis failed to occur because of both inadequate dosage and markedly reduced filtration rates. The clinical value of osmotic diuretics must be determined by additional studies. The use of (physical) osmotic diuretics in large adequate doses in combination with (metabolic) tubular-cell sodium-resorption blocking diuretics should be considered when edema states are refractory to all other diuretic therapy.

Hypoxia of Abnormal Physiologic Origin as the Final Common Pathway in Gastroduodenal Ulcer Genesis. E. D. Palmer and J. L. Sherman Jr. A. M. A. Arch. Int. Med. 101:1106-1117 (June) 1958 [Chicago].

The anatomy, physiology, pharmacology, and pathology of the gastroduodenal arteriovenous shunt system are reviewed in the discussion of hypoxia as the final common pathway in gastroduodenal ulcer genesis. The discovery of the gastroduodenal shunt system proffers an explanation for local hypoxia and tissue necrosis which has a physiological basis and is an explanation that does not depend on an already existing pathological process in the gastroduodenal wall. It is now possible to satisfy one of the most important criteria for any satisfactory theory of ulcer genesis, that the mechanism must permit the crater to be the result of an abnormal functional activity. The crater is merely a local manifestation of a systemic psychovisceral process, and in observing the great incidence of ulcer and the notable propensity of the lesion to repeat over and over the cycle of healing and breakdown, one becomes convinced that the final common pathway is a physiological process gone wrong. Vascular theories of ulcer etiology are very old, but until the native arteriovenous shunts were discovered, no reasonable mechanism could be postulated which could meet the most basic of the criteria for a proper etiological explanation. that the crater could form as a result of a physiological, not a pathological, excess or deficiency. It is proposed that the shunt mechanism, probably through induction of mucosal plethora rather than ischemia, supplies a reasonable explanation for hypoxia depression of mucosal vitality, the first step in crater formation.

Fulminating Post-Influenzal Pneumonias. H. A. Buechner, J. Thompson and W. H. Mosby. J. Louisiana M. Soc. 110:184-191 (June) 1958 [New Orleans].

During the last 5 months of 1957, 100 patients were treated for pneumonia, exclusive of those patients in whom pneumonia was considered to be a terminal event in the course of some other fatal disease. The average mortality rate from pneumonia in the 3 previous years was 8%, while in 1957 the rate rose sharply to 22%. The increased incidence and the unusual severity of these cases were directly related to influenza, since 54 of the 100 patients gave a recent prior history of "flu" or a "flu-like" illness. The Asian strain of type A influenza virus was isolated in 3 of the patients, and the hemagglutination-inhibition antibody titer was significantly elevated in 2 others. Twenty-four patients had pneumococcic pneumonia, 12 had staphylococcic pneumonia, and 6 had pneumonia due to Klebsiella pneumonia. The specific etiological agent could not be positively identified in the remaining cases, although Pseudomonas aeruginosa, Aerobacter aerogenes, Escherichia coli, and beta-hemolytic streptococci were suspected as representing the causative organism. The incidence of Friedländer's pneumonia and pneumococcic pneumonia was similar to that recorded for the year 1955. There was a decided increase in the incidence of cases of staphylococcic pneumonia over previous years. Staphylococci were further identified in mixed flora in 38 of the cases in which the specific etiology could not be determined. A history of influenza was disclosed in 17 of the 22 deaths recorded, although the Far East strain was isolated in only 2 instances. Nine patients died of staphylococcic pneumonia; 1 died of Friedländer's pneumonia, and 1 died of pneumococcic pneumonia; the exact type of pneumonia was unidentified in the remaining 11 patients. In those instances in which sensitivity studies were accomplished, the organisms were found to be highly resistant to all the available antibiotics. The fulminant nature of these pneumonias is attested by the fact that 4 patients died in less than 24 hours after admission, 15 died in less than 5 days, and the average duration of life after admission was 7.5 days. The most common bacterial pathogen was staphylococcus pyogenes var. aureus, which accounted for one-third of the deaths. Most of the deaths occurred in the 41-to-75 age group, only 2 deaths occurring in persons less than 40 years old. All save 2 patients in this series were reported as suffering from some type of chronic disease. Those patients with the severest infections tended to exhibit leukopenia, and a few showed neutropenia, while leukocytosis was an uncommon occurrence. Leukopenia in the presence of these severe infections is regarded as an ominous prognostic sign.

Acute Benign Pericarditis: Report of Two Cases Associated with Group A and Group B Coxsackie Viruses. E. R. Movitt, E. H. Lennette, J. F. Mangum and others. New England J. Med. **258**:1082-1086 (May 29) 1958 [Boston].

The association of "idiopathic" or acute benign pericarditis with diseases of known viral etiology has led to the suspicion that at least some cases of pericarditis may be of viral origin. This suspicion was suggested by recent reports, in which Coxsackie viruses were linked to several cases of acute myocarditis. The authors present 2 patients with pericarditis who were found to have infection due to a Coxsackie virus. The patients were men, aged 22 and 72 years respectively. Both patients showed a clinical picture that is usually recognized as the so-called benign or idiopathic pericarditis. In case 1 a Coxsackie virus identified as group B, type 3, was isolated from the stool, and a rise in neutralizing antibodies was demonstrable in the patient's serum against this type of virus. In case 2 a Coxsackie virus identified as group A, type 1, was recovered from the stool, and a rise in neutralizing antibodies against this particular virus type was also demonstrable.

Although a rise in antibody level to the infecting virus type was demonstrable in both patients, in neither was the rise of the magnitude generally regarded as "diagnostically significant." The "acute-phase" blood specimens in both patients already possessed comparatively high levels of neutralizing antibodies—that is, if the "acute-phase" specimen had been obtained earlier in the disease, a much greater rise in antibody titer during the course of the illness would most probably have been demonstrable. The fact that a Coxsackie virus was isolated from these patients, together with the fact that some increase in neutralizing antibody levels to the infecting virus type was demonstrable, is interpreted as evidence incriminating Coxsackie viruses of group B, type 3, and group A, type 1, as the etiological agents responsible for the pericarditis in the respective patients. Although the Coxsackie viruses enjoy an ubiquitous distribution and not infrequently can be recovered from persons without evidence of illness, there is ample evidence that these viruses have an etiological role in human disease. Additional etiological studies, however, will be required to indict, definitively and unequivocally, the Coxsackie viruses as incitants of acute benign pericarditis.

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The Clinical Significance of Serum Cyanocobalamin (Vitamin B_{12}) in Liver Disease. M. Rachmilewitz, J. Aronovitch and N. Grossowicz. A. M. A. Arch. Int. Med. **101**:1118-1128 (June) 1958 [Chicago].

In this series the serum cyanocobalamin values were correlated with the common liver-function tests and particularly with the degree and duration of bilirubinemia, where it appeared that the estimation of serum cyanocobalamin might serve as an early and sensitive test for differentiating the various types of jaundice. There were 37 patients with viral hepatitis, comprising a heterogeneous group of adult immigrants from Israel with poor nutritional backgrounds, 1 patient with acute yellow atrophy of the liver due to phosphorus poisoning, and 14 patients with portal cirrhosis, 5 of whom showed clinical and laboratory signs of active hepatitis. Six patients were in the advanced stage of portal cirrhosis in decompensation, the remaining 3 having a compensated portal cirrhosis. The total serum cyanocobalamin value was estimated by the modified Escherichia coli assay.

In patients with acute viral hepatitis there was no definite correlation between the high initial serum cyanocobalamin values and the degree of bilirubinemia, as concentrations of cyanocobalamin 10-to-20-fold greater than normal were associated with moderately elevated serum bilirubin concentrations, while only moderate elevations of serum cyanocobalamin levels were found in patients with marked bilirubinemia. An exceptionally high serum cyanocobalamin concentration was found in a fatal case of acute yellow atrophy of the liver due to phosphorus poisoning. Five patients with portal cirrhosis, showing findings of active hepatitis manifested by jaundice and severely altered hepatocellular liver function, had markedly elevated cyanocobalamin values. The 6 patients with advanced portal cirrhosis, who had clinical signs of portal hypertension but no evidence of active hepatitis, had cyanocobalamin values lower than those in the previous groups. Normal cyanocobalamin values were found in the remaining 3 patients with compensated portal cirrhosis, while higher values were demonstrated in 5 of the 6 patients with biliary cirrhosis who were all jaundiced, were in the advanced stage of the disease, and showed laboratory evidence of hepatocellular damage. The remaining patient in this group who was not jaundiced and showed no evidence of hepatocellular damage had normal cyanocobalamin values on 2 examinations. In patients with jaundice due to bile-stone obstruction with evidence of ascending cholangitis, the cyanocobalamin values ranged from 160 to 725 micromicrograms per milliliter, the higher value being found in a patient with carcinoma of the head of the pancreas. Two patients with chlorpromazine-induced jaundice, in whom the clinical and laboratory manifestations were characteristic of obstructive jaundice with hepatocellular damage, had normal serum cyanocobalamin values.

Chlorpromazine Jaundice: Clinical Course, Hepatic-Function Tests, and Pathologic Findings—Summary of Twenty Cases. W. F. Gebhart, R. A. Van Ommen, L. J. McCormack and C. H. Brown. A. M. A. Arch. Int. Med. 101:1085-1093 (June) 1958 [Chicago].

The incidence of jaundice in patients treated with chlorpromazine has been reported to be as low as 0.2% and as high as 5%. The resulting liver disease is regarded as a benign and self-limiting condition that can be relieved merely by withdrawing the drug, although in some instances the duration of jaundice and of abnormal results of liver-function studies may be protracted. Concomitantly, there may then develop extreme changes in lipid metabolism, which, in turn, are capable of producing hepatohypercholesteremic cirrhosis, or primary biliary cirrhosis. The mechanisms by which chlorpromazine produces a rather specific type of liver disease are not known, notwithstanding the resemblance in the liver to those changes caused by arsphenamine, thiouracil, methyltestosterone, and substances of similar chemical structure. The major feature of this entity is an intrahepatic obstruction to the flow of bile.

The likeliest explanation for chlorpromazine-induced jaundice would seem to be on the basis of an allergic mechanism, which results eventually in intrahepatic cholestasis and bile-plugging. This explanation is supported by the presence of a latent period between the institution of therapy and the appearance of clinical jaundice or changes in the results of hepatic-function tests, or both. The not infrequent occurrence of a peripheral eosinophilia and of the periportal eosinophilic filtrate noted on biopsy lends favor to the possibility of an allergic mechanism. Shay and Siplet in careful studies on 47 patients treated with chlorpromazine found the serum alkaline phosphatase determination to be the most sensitive means of detecting early sensitivity reactions to chlorpromazine.

Twenty cases of chlorpromazine-induced disease of the liver have been studied in which the daily patient dosage ranged from 30 to 150 mg. Seventeen patients received 75 mg. or less. The duration of administration of the drug ranged from 2 to 28 days, 8 patients having received the drug for less than 20 days, 9 having received it for 20 to 30 days, and 3 having received it for 42, 49, and 58 days respectively. In most of the patients, none of whom were known to have previously had liver disease, jaundice developed between 2 and 4 weeks after administration. Fourteen of these patients exhibited an "influenza-like" syndrome, with chills, varying degrees of fever, malaise, nausea, and generalized muscular aching prior to the onset of jaundice. Coincident with, or shortly thereafter, 16 patients experienced a moderate-to-severe degree of generalized pruritus. Eleven of the patients reported some degree of right upper quadrant pain or epigastric abdominal distress, although none described the "classic" pain of biliary colic. A relative eosinophil count of greater than 8% was found in 8 patients, the highest noted being 30%. Repeated cephalin-cholesterol flocculation tests in 19 patients were negative, the zinc sulfate turbidity test was normal in all 10 patients in whom the test was utilized, and the thymol turbidity test yielded slightly elevated values in 6 of 20 patients studied. Total serum protein, serum albumin, and serum globulin determinations obtained in all patients were normal in 17 patients, 3 of them exhibiting slight reversal of the albumin-globulin ratio. The duration of jaundice and of abnormal results of hepatic-function studies varied in length from 8 days to 10 months (2 cases).

Insofar as liver-cell morphology is concerned, the absence of necrosis is 1 of the major features in differentiating chlorpromazine jaundice from viral hepatitis, necrosis having occurred in only 1 of the 15 patients evaluated. The absence of bile in the large ducts—found in all of the patients—is the major differentiating factor between chlorpromazine-induced liver disease and obstructive jaundice of large bile duct origin. Capillary bile thrombi were found among the liver-cell cords in all specimens, although bile duct proliferation of small hepatic ducts of small degree was found in only 3 specimens. Treatment in all 20 patients was the same as that administered for cirrhosis: high-carbohydrate and high-protein diet, bed rest, and large doses of supplemental vitamins, especially the B complex. Steroid therapy was found to be ineffective in 5 patients. Although it is difficult to evaluate the effectiveness of this therapy in the 20 patients, it is believed that treatment of this condition should parallel that of hepatitis, as it should at least minimize damage to the liver from the obstructive jaundice itself.

Hemopancytopenic Medullary Erythroblastomatosis. G. Paniagua, J. Sánchez Fayos and H. Oliva. Rev. clín. españ. 68:356-362 (March 31) 1958 (In Spanish) [Madrid].

Hemopancytopenic medullary erythroblastomatosis is extremely rare. Rohr described a case under the term "diffuse medullary erythroblastoma." The case reported by the authors is the second in the literature. A man, 47 years old, reported to the hospital, complaining of gastric disorders and of having had for the last 2 months asthenia and rapid loss of weight. Examination of the peripheral blood showed a picture of pancytopenia, hypochromic anemia, and erythromegaloblastemia. The bone marrow obtained by sternal puncture showed erythropoietic hyperplasia with a pronounced proliferation of erythrogigantoblasts approaching the type of neoplastic cells. Therapy with liver extracts, vitamin B_{12}, iron, and blood transfusions was ineffective. The patient rapidly grew worse and died in 3 months. The disease is a malignant form of idiopathic erythremic myelosis with exclusive medullary localization, which interferes with normal hematopoiesis and which is entirely different from erythroleukosis and from either symptomatic or primary chronic leukoerythroblastosis.

Nonsyphilitic Interstitial Keratitis and Bilateral Deafness (Cogan's Syndrome) Associated with Cardiovascular Disease. B. Eisenstein and M. Taubenhaus. New England J. Med. 258:1074-1079 (May 29) 1958 [Boston].

Nonsyphilitic interstitial keratitis with vestibuloauditory symptoms was first recognized as a clinical entity by Cogan in 1945. This syndrome usually occurs in young adults and is of sudden onset, initiating with either the ocular or the aural manifestations. The vestibuloauditory symptoms are similar to those seen in Ménière's syndrome and consist of sudden onset of vertigo, tinnitus, nausea, vomiting, and rapid development of deafness. With the appearance of deafness, which is often complete, the vestibular symptoms subside. The ocular findings are often much less dramatic, and the date of onset may be established only in retrospect. The patient may have lacrimation, sensation of a foreign body present, blurring of vision, and blepharospasm. Of great interest is the association of this syndrome with systemic disease, in particular of the cardiovascular apparatus.

The authors present the histories of 3 patients with Cogan's syndrome, who were observed at the Michael Reese Hospital in Chicago in recent years. In the first patient an aortic insufficiency due to a valvulitis developed after the onset of the eye-and-ear symptoms. The valvulitis led to valvular aneurysm formation, perforation of an aortic cusp, congestive heart failure, and death. Autopsy revealed a healed endocarditis, with unusual fibrinoid degeneration of the aortic valves, as well as arteritic changes in the small branches of the coronary arteries that had led to multiple small infarctions of the myocardium. The history of the second patient had been described previously by Oliner and co-workers, and the account given here was a 7-year follow-up study. In this patient the vestibuloauditory and corneal involvement was followed by an extensive necrotizing angiitis, which subsided after a stormy course and left no apparent residual damage to the cardiovascular system. The history of the third patient is of interest, because an interval of almost 2 years elapsed between the onset of the keratitis and the auditory symptoms. Except for undiagnosed transient pulmonary findings, no systemic manifestations could be proved. Reviewing the literature, the authors call attention to the frequency of cardiovascular disease, which suggests that Cogan's syndrome may represent a part of a more generalized disease in which the heart and the small vessels may become involved.

Pulmonary Hypertrophic Osteoarthropathy (Periostitis): Its Absence in Pulmonary Tuberculosis. A. B. Skorneck and L. B. Ginsburg. New England J. Med. 258:1079-1082 (May 29) 1958 [Boston].

Clubbing and hypertrophic osteoarthropathy usually reflect disease in the lungs. Under some concepts of etiology, the osteoarthropathy is regarded as simply an advanced response of tissue to the same stimulus that causes clubbing. This "unified" theory has tended to obscure real differences between clubbing and hypertrophic osteoarthropathy. The authors apply the term "pulmonary hypertrophic osteoarthropathy" to the roentgenographically demonstrable changes of bone and soft tissue that occur in association with, or as a result of, pulmonary disease. These changes are distinct from the physical findings of clubbing, a term that should apply only to the soft-tissue and nail alterations in the fingers and toes. Clubbing is frequently observed in patients with many varieties of pulmonary disease and is occasionally found in other chronic states not related to primary lung disorders. It rarely produces symptoms and is usually discovered on routine physical examination. Pulmonary osteoarthropathy, on the other hand, may cause symptoms ranging from mild aches to severe pains in the region of the affected bones and nearby joints; it is not detected unless it is symptomatic, and the examining physician is then curious enough to obtain roentgenograms of the affected part.

If pulmonary osteoarthropathy were simply a more advanced stage of the same process that causes clubbing, one would expect that among tuberculous patients with advanced disease and pronounced clubbing the roentgenographic features of pulmonary osteoarthropathy would be manifested at least occasionally. Roentgenograms were made of the hands, including the distal part of the radius and ulna, in every patient admitted to the tuberculosis building of the West Haven (Conn.) Veterans Administration Hospital. Over a period of 3 years, 390 newly admitted patients were examined. It was found that no patient with active tuberculosis had pulmonary hypertrophic osteoarthropathy. Three cases of pulmonary osteoarthropathy were uncovered incidentally during this period of observation among a number of patients who were admitted to the hospital with a presumptive diagnosis of pulmonary tuberculosis. It is interesting that none of the patients with pulmonary osteoarthropathy actually had tuberculosis. The final diagnoses were lung cancer in 2 patients and pyogenic abscess in 1. Rarely, pulmonary osteoarthropathy may develop in complicated thoracic tuberculosis, such as empyema. Given a patient with pulmonary disease, the discovery of osteoarthropathy (periostitis) by x-ray examination of the extremities militates against a diagnosis of tuberculosis.

Suppurative Arthritis Complicating Rheumatoid Arthritis. J. H. Kellgren, J. Ball, R. W. Fairbrother and K. L. Barnes. Brit. M. J. 1:1193-1200 (May 24) 1958 [London].

The authors report on 12 patients, between the ages of 37 and 66 years, with rheumatoid arthritis in whom bacterial infection occurred in connective tissues and on 13 patients, between the ages of 7 and 67 years, with monarticular suppurative arthritis associated in most cases with trauma, penetrating wounds, or an obvious source of infection. These 25 patients were the only ones with suppurative arthritis among 91,815 patients admitted to the Manchester Royal Infirmary during the years from 1950 through 1957; these findings show the rarity of the condition. In 9 of the first group of 12 patients, the condition was a suppurative arthritis which was often polyarticular, resembling an exacerbation of the rheumatoid process. The infecting organisms were of the coliform group in 2 patients and were staphylococci in 10 patients, of whom only 3 were sensitive to penicillin. The febrile and leukocytic response to infection with these organisms was often modified or absent, and in some patients the widespread suppuration was revealed only by a systematic examination of the joints at autopsy. Five of the 12 patients with rheumatoid arthritis died, while not 1 patient of the 13 with suppurative arthritis died. It seems that the prognosis can also be much improved in the first group, provided that the correct diagnosis of suppurative bacterial infection is made at an early stage and the infecting organisms can be cultured from either the blood or the infected joint fluid, so that their sensitivity to the available antibiotics can be assessed.

The diagnosis in the second group presented no difficulty, since the symptoms conformed to the classical description of monarticular suppurative arthritis. These patients responded promptly to the antibiotic therapy, and their illness never became serious. The most useful indication of bacterial infection was increased pain and swelling in several joints, accompanied by deterioration in general health and the occurrence of rigors or unexpected discharge of pus. Absence of the normal response to bacterial infection with pyogenic organisms presented a major difficulty. In some patients staphylococcic pus was present, the white blood cell counts were 4,300 and 5,800 per cubic millimeter, and the patients remained afebrile, while other patients had fever from the active rheumatoid disease, and it was only when the fever increased and became remittent that it became apparent that an infective process had supervened. Widespread infection of joints and bones should be suspected in any patient with rheumatoid arthritis in whom there is a sudden deterioration or an unexplained remittent fever, especially if a history of rigors can be elicited. Aspiration of all the more painful joints, with culture of the joint fluid, and repeated blood cultures are required, since this appears to be the only certain way of arriving at a correct diagnosis. If diagnosis can be made at an early stage, appropriate antibiotic therapy and energetic treatment can give excellent results in what may otherwise be a fatal condition.

Atypical Heat Stroke with Hypernatremia, Acute Renal Failure, and Fulminating Potassium Intoxication. C. R. Baxter and P. E. Teschan. A. M. A. Arch. Int. Med. 101:1040-1050 (June) 1958 [Chicago].

The persistance, after initial diagnosis, of injuries attributable to heat stroke indicates that treatment with intravenously or orally administered saline solutions alone may be inadequate to prevent further disability imposed by a heat load. Two vital principles in the treatment of heat stroke are the rapid reconstitution of the circulating blood volume and the rapid lowering of temperature. The potential volume of the vascular tree is greatly enhanced by cutaneous and muscular dilatation to the extent that large quantities of salt and water are necessary to meet the discrepancy between the existing blood volume and the expanded vascular space. The rapid dissipation of body heat (which is best accomplished by immersion in ice water until the temperature falls below 101 F [38.33 C] or by alcohol sponging in the absence of shock and excessive hyperpyrexia) reduces the quantities of salt and water necessary to meet this discrepancy. Thus, in the initial stages of therapy, the administration of levarterenol is contraindicated in that the generalized increase in peripheral vasoconstriction reduces the blood flow to the body surfaces, thereby impairing heat loss and accentuating the basic physiological defect. From this clinical setting of persistent shock and hyperpyrexia in the case of 2 patients (and even with a transitory recovery from shock in 1 other patient), the authors describe a progressive downhill course, which was characterized by tachycardia, coma, tachypnea, oliguria, fulminating hyperkalemia, and metabolic acidosis.

Hypernatremia, preceding or accompanying heat stroke, may influence the clinical picture. Several of the 100 patients reported by Austin and Berry had an elevated serum potassium level, as did the 3 patients reported here in whom the central nervous system symptoms were extremely severe. Other reports of patients with heat injury mention a small but definite incidence of oliguria and acute tubular necrosis, the development of which has not been correlated with the clinical course. Histological changes of acute tubular necrosis were present in the authors' 3 patients, although an antemortem diagnosis could not be made in 2 in the presence of shock. In the absence of prompt diagnosis and vigorous therapy a bizarre clinical picture may result, including shock, oliguria, and continued hyperpyrexia, with abrupt elevation of serum potassium level resulting in death from fulminating myocardial potassium intoxication.

Tuberculous Tracheobronchial Lymph-Node Involvement in Maturity. J. Le Melletier and T. T. Caulet. Semaine hôp. Paris 34:1425-1436 (May 18) 1958 (In French) [Paris].

Active tuberculosis of the tracheobronchial lymph nodes, alone or in association with pulmonary lesions, seems to be comparatively common in middle-aged and elderly patients. Affected lymph nodes larger than a hazelnut were found at autopsy in 14 of 20 tuberculous subjects, aged more than 40 years. Three were due merely to anthracosis without evident specific lesions. The other 11 were found in subjects with caseosclerous tuberculosis (6), caseous tuberculosis without significant sclerosis (3), and alveolar tuberculosis (2). The specific formations observed in most of the specimens (9 out of 11) appeared to be at least partly recent in origin. The combination most often found was the presence in a single node of active tuberculous lesions and dense sclerosis that had apparently existed for a long time. Extension of the tuberculous process to, or rupture of the lymph-node lesions into, the adjacent organs, especially the bronchi, is the principal anatomic characteristic of this type of lymph-node involvement, which is usually found only at autopsy, often passing unnoticed during the patient's life. Roentgenographic pictures suggestive of lymph-node involvement, however, are found in many older patients with endotracheal tuberculosis.

The principal bronchoscopic findings are anthracotic ulceration and deforming bronchitis. The coexistence of tracheobronchial lymph-node involvement with ordinary pulmonary tuberculosis has little effect on the course of the disease, but when the tracheobronchial lymph-node involvement, either alone or with discrete pulmonary lesions, is the dominant condition, the clinical picture is quite different. Hemoptysis, sometimes repeated, was the warning symptom in 5 of the authors' patients. Recurrent bronchial attacks and enlarged lymph nodes in the neck each led to discovery of the condition in 2 patients, and in 2 others it was detected on roentgenologic examination. The course is usually torpid, but severe complications, such as pleurisy and tuberculous pleuropericarditis, may occur. Various nonspecific factors probably enter into the development or reawakening of tuberculous tracheobronchial lymph-node infection, but undoubtedly the most important are denutrition and advanced age, local irritation caused by anthracotic or calcareous deposits, and ordinary infections.

Osteomyelosclerotic Disease. G. Levi and C. Almici. Policlinico (sez. prat.) 65:567-577 (April 14) 1958 (In Italian) [Rome].

Four patients with osteomyelosclerosis were hospitalized with the following symptoms: pain in the bones, pallor, general weakness, abdominal pain, mostly in the splenic region, and splenomegaly. Anemia was present in 3 patients, a mild leukocytosis in 1, and a small decrease in blood platelet count in 1. Material obtained by spleen biopsy in 2 patients revealed the presence of metaplastic myeloid tissue. Hardened bone obstructed the completion of sternal biopsy in all patients except 1, from whom only a small amount of bone marrow was obtained. Urobilinuria and indirect hyperbilirubinemia were found in 1 patient only; however, the Coombs test and the erythrocyte fragility test showed normal values. Roentgenologic findings revealed osteosclerotic changes in all skeletal parts in 2 patients and in the spinal column only in 2.

Osteomyelosclerosis is a disease running a chronic course. Since every specific therapeutic regimen has seemed to be fruitless, the patients were given a symptomatic treatment consisting of blood transfusion and antianemic management. They were discharged in an improved but uncured state. One patient died shortly after the discharge. Increases in both red and white blood cells and enlarged platelets were observed in this patient after splenectomy; histological examination of the resected spleen and of material obtained by liver biopsy revealed the presence of metaplastic myeloid tissue of megakaryocytic type.

SURGERY

Multicentric Carcinomas of the Oral Cavity. C. G. Moertel and E. L. Foss. Surg. Gynec. & Obst. 106:652-654 (June) 1958 [Chicago].

Of 732 patients with proved oral cancer seen at the Mayo Clinic during the 10-year period from 1944 through 1953, a total of 64 (or 8.7%) were found to have 2 or more discrete oral cancers. Associated leukoplakia was found in 75% of the patients with multiple oral lesions. An overwhelming majority of the patients were users of tobacco, particularly in the forms which expose the mouth to tobacco juices. The tendency to multicentricity shown by patients with oral cancer also extends to involve the contiguous squamous epithelium of the lips, pharynx, larynx, and esophagus. Fifty-five patients with oral carcinoma were found to have additional primary lesions in these locations, thus raising the over-all occurrence rate of multicentricity to 16.4%. When oral cancer develops, all the contiguous squamous mucous membranes must be considered as highly susceptible to future malignant change. It is the responsibility of the physician to insist on frequent and regular follow-up examinations, so that any second lesion may be detected and treated in its early stages. It is also his responsibility to initiate appropriate prophylactic measures to eliminate any possible sources of carcinogenic irritation to these regions.

Idiopathic Perforation of the Stomach in the Newborn. K. B. Castleton and F. F. Hatch. A. M. A. Arch. Surg. 76:874-881 (June) 1958 [Chicago].

After the elimination of those cases of perforation of the stomach in the newborn infant thought to be due to peptic ulcer disease, to the passage of a gastric tube, to the administration of oxygen, to trauma of the chest and abdomen, and to obstruction, infection, anoxia, intracranial lesions, and vascular lesions, there still remains a group of cases which constitute an entity better termed "idiopathic perforation of the stomach in the newborn." In order to fall in this category, the case should fulfill the following criteria: (1) be that of a newborn infant from a few hours to a few days old; (2) have no evidence of a peptic ulcer; (3) have no evidence of perforation of the stomach by gastric tubes or by the administration of oxygen, or of trauma to the chest and abdomen; and (4) have no evidence that perforation occurred as the result of obstruction of the intestine, of vascular lesions of the stomach, or of significant cerebral lesions. A review of the literature indicates that some 40 cases fulfill these criteria. Male patients outnumber female patients in a ratio of 2.5:1. The youngest patient was 11 hours old and the oldest 10 days old at the onset of symptoms. Race plays no role, and only 1 case had been reported with a positive Wassermann reaction. Too few cases have been reported to fully evaluate the significance of the Rh factor. Twenty-two of the 24 patients that had x-ray studies showed free air in the peritoneal cavity. Operation was done on 23 patients, with 8 survivals. None of the infants not operated on survived. The muscular layer in 13 of the infants was reported absent at the site of perforation and thinned out in 5 others. Six of the infants exhibited congenital anomalies; however, none of them were premature infants. Of the 30 cases reported, the site of perforation was on the greater curvature in 22, on the lesser curvature in 4, on the anterior wall in 2, in the fundus in 1, and in the cardia in 1.

Typically, the infant is born with little or no trouble, is often small, and is frequently premature, with a higher than normal incidence of congenital defects. He remains well for a few hours and then may refuse feedings, vomit, demonstrate a high, low, or normal white blood cell count, and sometimes have fever. In addition to having a tense, distended, and often edematous abdomen, he is frequently dyspneic and even jaundiced. X-ray examination gives a remarkably uniform picture of large amounts of free air in the abdomen, especially in the upper portion. The only treatment is surgical and must be done early, for, as soon as the peritoneum is incised, gas escapes under pressure and evidence of peritonitis is seen. The authors report 3 cases, making a total of 43 cases of this type reported. One patient is of interest in that his case was diagnosed preoperatively; he was successfully operated on after the first and second perforations, only to develop a third perforation from which he died.

Results of Surgical Treatment for Severe Chronic Gastritis. E. S. Judd and C. C. Edwards. A. M. A. Arch. Surg. 76:882-887 (June) 1958 [Chicago].

An ever-increasing experience with patients who exhibited severe symptoms, including repeated hemorrhage, and who were given a definite diagnosis of ulcer, polypoid disease, or cancer after thorough study by competent internists, but who were found on surgical exploration to have only severe gastritis, prompted the authors to analyze a series of cases in which this problem had presented itself. The records of the Mayo Clinic between Jan. 1, 1946, and Dec. 31, 1950, were examined to obtain material for this study, and revealed 51 cases of severe chronic gastritis as the proved surgical pathological entity without any other coexisting gastric or duodenal disease. The patients ranged in age from 33 to 65 years, the average age being 50.2 years. The preoperative clinical diagnosis proved to be extremely difficult and variable. Gastric analysis appears to have made only a minor contribution to the diagnosis. In a great majority of the cases there was unequivocal x-ray evidence of serious gastric or duodenal disease. Little emphasis was placed on gastroscopy in view of the limitations of the procedure.

Of the 51 patients, 32 had been treated immediately by partial gastrectomy, 16 had undergone gastrotomy with internal examination of the stomach and biopsy of at least 1 area of the mucosa, and 3 had submitted to vagotomy after biopsy. A large group (72%) of patients who had resection were considerably improved, as indicated over the course of a 7-year follow-up study. Mere gastrotomy with biopsy was definitely less successful than resection, although medical management subsequently has kept many of these patients relatively comfortable. Several patients would appear to have been helped by vagotomy. Only 9 of the patients had experienced gastrointestinal hemorrhage before operation, either melena or hematemesis, or both. Two patients of the resection group continued to bleed after operation. The exact nutritional difficulty experienced by the patient was rather difficult to evaluate from the history prior to operation, and the analysis did nothing to clarify this issue. Likewise, it was difficult to assess the nutritional status of patients after operation, although it was learned that 2 patients in the resection group had "dumping syndrome" in the early weeks after resection and have continued to complain of rapid filling, weakness, difficulty in maintaining their weight, and a constant necessity for taking iron and vitamins and for supportive therapy. The complications after surgical management were in no way remarkable. No deaths in the hospital followed surgical treatment for these patients, and none of the patients have yet demonstrated a malignant gastric lesion. Thus, when a surgeon is confronted with a problem of severe gastritis, having already committed himself to laparotomy, in the light of present-day morbidity and mortality possibilities, gastric resection should be given serious consideration.

'cal Treatment for Endocardial Fibroelastosis or Anomalous Left Coronary Artery: Four Years' Experience with Poudrage. R. N. Paul and S. G. Robbins. Am. J. Cardiol. 1:694-705 (June) 1958 [New York].

The authors report on 4 boys and 6 girls, between the ages of 6 and 24 months, who were operated on for either anomalous left coronary artery or primary endocardial elastosis by means of the poudrage technique, a relatively simple procedure of instilling sterile talc powder into the pericardial sac over the surface of the left ventricle. The first 4 patients operated on have been followed for 4 years. Of the 4, 1 died during the immediate postoperative period; the other 3 are all living and well, and none of them is now receiving digitalis. All 3 patients seem to be clinically improved in comparison with their preoperative condition. The first patient seems to have progressed better, in general, than the other 2; he is completely asymptomatic and appears entirely normal in all respects except for heart size. In the second patient, multiple premature ventricular contractions and cardiac decompensation occurred 1 year after operation and necessitated resumption of digitalis therapy. Administration of digitalis was discontinued 8 months later, with no further signs of heart failure but with occasional occurrence of premature contractions. The third patient continues to manifest very mild dyspnea, which has persisted in this degree since shortly after the operation. Of the remaining 6 patients, 3 died, and the 3 survivors have been followed from 2½ to more than 3 years postoperatively. All the survivors are clinically well without having received digitalis for more than 2 years. The 6 survivors of both groups now range in age from 4 years to 4 years and 9 months and have shown improvement with respect to weight curve (Iowa State grid), heart size, and/or cardiothoracic ratio. It is felt that considerably more time is necessary for absolute proof of the merit of surgical treatment with the aid of poudrage, but with up to 4-year survival associated with general clinical improvement in the 6 survivors, the authors are quite enthusiastic that the procedure is beneficial.

Adrenalectomy for Hyperfunctioning Lesions of the Adrenal Cortex. E. H. Ellison and G. J. Hamwi. A. M. A. Arch. Surg. 76:843-856 (June) 1958 [Chicago].

This report of adrenocortical hyperfunction problems is based upon cases reported in the literature and upon 12 cases in which the patients were treated by total or subtotal adrenalectomy; the latter include 8 cases of primary Cushing's syndrome, 2 cases of Cushing's syndrome secondary to pituitary tumor, 1 case of pituitary aldosteronism, and 1 case of congenital virilism associated with an adrenocortical carcinoma. For the purpose of clarification, the lesions have been categorized as (*a*) functioning tumors of the adrenal cortex and (*b*) adrenocortical hyperfunction without tumor. These categories are further subdivided into 3 disease entities according to the hormone secreted in excess: (1) Cushing's syndrome produced by excessive hydrocortisone; (2) aldosteronism produced by excessive aldosterone; and (3) virilism produced by excessive adrenal androgens. On occasion these tumors are capable of secreting excessive amounts of estrogens resulting in feminization. The adrenal cortex is capable of secreting any combination of the above factors, so that mixed syndromes manifesting any or all of the clinical findings seen in Cushing's syndrome, aldosteronism, or virilism are present.

All 8 patients with primary Cushing's syndrome are alive and well, the time since operation varying from 3 months to 5 years. Age at operation ranged from 7 to 52 years. Of the 6 patients on whom subtotal adrenalectomy was performed, one required the removal of additional adrenal tissue for persistence of symptoms, and another required replacement therapy. Two patients underwent successful total adrenalectomy. Three of the 8 patients with primary Cushing's syndrome developed the following postoperative complications: paralytic ileus, 1; atelectasis, 2; and infections, 2. Six of the 8 patients had preoperative systolic blood pressures in excess of 150 mm. Hg; 5 of them are now normotensive. Preoperative blood pressures in the 2 patients who underwent total adrenalectomy were 225/142 and 180/120 mm. Hg. respectively; both these patients are now normotensive. The single operative death in the series was due to hemorrhage secondary to an abnormal clotting mechanism in 1 of the patients with a primary pituitary tumor. Several months after subtotal adrenalectomy, the 1 patient with aldosteronism developed increased intracranial pressure, which responded to ventricular taps and eventually to cortisone replacement therapy. The 1 patient with virilism menstruated several months ago; her body contour is now more feminine, and her general well-being is excellent.

The operative approaches to the adrenal glands are many and varied. Several considerations are paramount in the selection of an approach. First, the surgeon must be able to visualize both of the adrenal glands before deciding upon the definitive operative procedure. Second, he should be able to explore the ovaries for disease simulating cortical hyperfunction or tumor. Finally, the site of cortical rests should be examined for aberrant adrenal tissue. The only procedure found to meet all these criteria is the anterior transabdominal approach, which permits exposure of all adrenal tissue, including sites of cortical rests, as well as exploration for ovarian disease.

An Evaluation of Implantation of the Internal Mammary Artery into the Myocardium of Pigs and Dogs. H. H. Patt, M. Goldberg, J. V. Clift and B. Lourvanij. J. Thoracic Surg. 35:699-705 (June) 1958 [St. Louis].

In their studies on the revascularization of the myocardium, the authors were particularly interested in the internal mammary artery implant. They selected the weanling pig for their studies primarily because its coronary circulation is of the end-artery type and very closely approximates that of the human being. It has been shown that ligation of the left anterior descending artery in the pig results in almost 100% mortality within 15 minutes. Of 25 pigs which survived the implantation of the left internal mammary artery into the myocardium of the left ventricle, 11 were operated on after a 6-to-12-week period, and a test ligation of the left anterior descending artery was performed. Of this group, 10 died promptly of ventricular fibrillation, suggesting a failure of the implant to protect the myocardium from the effects of left anterior descending artery ligation. Postmortem examination in each of these 10 animals revealed gross and microscopic occlusion of the implanted internal mammary artery. Fourteen of the pigs with internal mammary artery implants grew too large to handle for secondary operation in the laboratory. These were slaughtered at an abattoir, and the hearts were removed for examination. In no instance was an anastomosis demonstrable between the internal mammary artery implant and the coronary circulation. Only 1 pig in the series of 25 could be considered to have a successful internal mammary artery implant.

In another series of tests the authors used mongrel dogs, duplicating the conditions of Vineberg's 1946 experiments on internal mammary artery implantation. A significant anastomosis was demonstrable in only 1 of 19 dogs (5.3%) subjected to implantation of the internal mammary artery after partial ligation of the left anterior descending artery. The authors concluded that in their hands the implantation of the internal mammary artery into the myocardium was not a satisfactory method for improving the blood supply to the heart.

Nonpenetrating Traumatic Injury of the Aorta. L. F. Parmley, T. W. Mattingly, W. C. Manion and E. J. Jahnke Jr. Circulation 17:1086-1101 (June) 1958 [New York].

Of 1,174 persons who died of nonpenetrating traumatic injury of the heart and aorta and on whom autopsy was performed at the Armed Forces Institute of Pathology in Washington, D. C., 275 had rupture of the aorta, and 21 had laceration involving only 1 or 2 layers of the aorta. The total number of 296 cases of nonpenetrating traumatic injury of the aorta suggests that this lesion should be suspected more frequently in the traumatized person. In 114 of the 275 persons the aortic rupture was produced by an automobile accident. The aortic isthmus, just distal to the left subclavian artery, was the commonest site of rupture; the rupture occurred at this site in 124 of the 275 persons. Thirty-eight of the 275 persons survived the initial injury for a time, an over-all survival rate of 13.8%, but this figure included those with associated cardiac injury. Almost 20% of all persons who sustain a traumatic rupture of the aorta without associated cardiac lesions may be expected to survive at least temporarily. One hundred one (36%) of the 275 persons had minimal or no external evidence of chest injury, despite a high incidence of rib fracture. Although many patients were in shock initially, blood pressure was within normal range in 10 and became normal in an additional 19 soon after measures to combat shock were instituted. Chest or abdominal pain, dyspnea, tachycardia, hemoptysis, and cyanosis were the more common clinical manifestations. These signs and symptoms were most often attributed to other injuries, frequently to associated pulmonary lesions. These observations emphasize that external evidence of trauma may be minimal and that initial evidence of definite cardiovascular injury may be lacking. Roentgenologic signs of a widened mediastinum, evidence of persistent thoracoabdominal hemorrhage, and the appearance of delayed hemothorax represent early diagnostic criteria of aortic rupture.

Diagnosis of aortic rupture is easiest in those cases in which a traumatic false aneurysm of the aorta develops and then remains stable and asymptomatic. Routine x-ray examination of the chest was the means whereby diagnosis was made in 9 patients. The causation of the aneurysm is suggested when the past history is evaluated in the light of the x-ray findings. Prompt diagnosis of traumatic rupture of the aorta is essential if surgical treatment is to be performed before fatal sequelae develop. Surgical treatment of a traumatic aneurysm of the aorta that is producing no symptoms and has been shown to have remained unchanged over a period of years should be approached only after careful consideration. Successful surgical resection of a traumatic aneurysm of the aorta and repair of the defect with aortic homografts in 2 patients are reported.

Five Year Survival After Anterior Resection for Carcinoma of the Rectum and Rectosigmoid. C. W. Mayo, M. Y. Laberge, and W. M. Hardy. Surg. Gynec. & Obst. *106*:695-698 (June) 1958 [Chicago].

Records of 171 patients who had undergone anterior resection for carcinoma of the rectum and rectosigmoid at the Mayo Clinic in 1950 and 1951 were reviewed, and this series was compared with 336 cases of anterior resection performed from 1945 through 1949. The age and sex of the patients, the proctoscopic level of the lesions, and the grade of malignancy were essentially the same in both groups. During the 5-year period from 1945 through 1949, there were 15 hospital deaths among the 336 patients, giving a hospital mortality rate of 4.5%. For the 2-year period from 1950 through 1951, there were 10 hospital deaths among the 171 patients, giving a mortality rate of 5.8%. The 5-year survival rate was 3.5 percentage points better in the series of cases in 1950 and 1951 than it was in the series from 1945 through 1949. The results in the total of 507 patients with carcinoma of the rectum and rectosigmoid treated by sphincter-saving anterior resection were compared with results obtained in similar patients treated by sphincter-sacrificing procedures. It was concluded that the sphincter-saving operation compares favorably from the curative standpoint with 1-stage combined abdominoperineal resection or 2-stage posterior resection performed for lesions in the controversial segment of the intestine; that is, those situated between 6 and 14 cm. from the dentate margin.

The authors presented these statistics in order to demonstrate that adequate radical resection of carcinoma of the upper rectum and rectosigmoid does not require removal of the rectal sphincter in all cases. The decision as to whether or not the sphincter should be sacrificed in individual cases must be made by the surgeon. The decision must be based on the technical feasibility of removing the lesion from above and of excising the intestine far enough below the lesion to accomplish complete extirpation of any distal spread. When this is possible, the surgeon is justified in selecting the sphincter-saving procedure.

Surgical Repair of a Traumatic Aortic-Right Ventricular Fistula. H. King and H. B. Shumacker Jr. J. Thoracic Surg. 35:734-739 (June) 1958 [St. Louis].

This report is concerned with an aortic-right ventricular fistula of traumatic origin. The patient was a 15-year-old boy who was hammering a blank cartridge when it exploded and struck him in the chest. He was dyspneic on arrival at his local hospital. A loud cardiac murmur was heard. He was transferred to the Indiana University Medical Center in Indianapolis 10 hours after injury. He was in acute distress. There were 2 small lacerations in the third interspace, about 5 cm. from the midline. A small amount of subcutaneous emphysema was present over the upper chest on the left side. A harsh, grade 4 to 5, continuous murmur was heard throughout the entire precordial area but most loudly in the second left anterior interspace. A continuous thrill was palpated in the same area. Fluoroscopy revealed a slight increase in the size of the pulmonary conus and a questionable enlargement of the left ventricle. An irregular opaque foreign body, measuring 1 cm. in greatest diameter, was present in the left anterior mediastinum. The impression was that the continuous murmur resulted from the injury to the chest. Later the authors arrived at the erroneous conclusion that the patient more likely had a congenital patent ductus arteriosus and that the injury was unrelated. The site of the injury healed, and the patient was discharged.

At a thoracotomy 10 weeks later, a patent ductus was not found. The continuous thrill could be palpated through the pericardium anteriorly in the region of the base of the pulmonary artery or right ventricular outflow tract. In this area there was dense scar tissue and adhesions of the pericardium to the anterior chest wall. Since open cardiotomy with bypass of the heart and lungs seemed necessary, the pericardium was not opened at this time. At a bilateral anterior thoracotomy, carried out about 6 months after the injury, the venae cavae and the left femoral artery were cannulated, and cardiopulmonary bypass was begun. After cardiac standstill was achieved, the right ventricle was opened through a vertical incision made downward from the base of the pulmonary artery. The fistula was easily seen. It measured about 1 cm. in diameter. A narrow fibrous band lined the edge of the defect. A Kelly clamp was easily passed through this opening and emerged within the aorta in the region of the right coronary sinus of Valsalva. The defect was closed, and the right ventriculotomy was then closed. After the clamp was removed from the aorta, ventricular fibrillation began, and 4 electric shocks were necessary to convert the heart action to a normal rhythm. After the cannulas were removed, a large part of the scarred anterior pericardium was excised. The patient gained 13 lb. (5.9 kg.) in the first 8 weeks after operation. His exercise tolerance greatly increased.

Five Cases of Congenital Aneurysm of the Aortic Sinuses (of Valsalva) and Notes on the Prognosis. H. G. Davidsen, J. Fabricius and E. Husfeldt. Acta med. scandinav. 160:455-470 (No. 6) 1958 (In English) [Stockholm].

In most of the recorded cases of aneurysm of the aortic sinuses, the diagnosis has been made at autopsy. The absence of severe clinical symptoms before complications have arisen and the short time of survival after the appearance of complications may be responsible for the rarity of diagnosis in the living patient. During the last few years 5 patients with congenital aneurysm of the aortic sinuses were observed in the Rigshospitalet of the University of Copenhagen. [Rupture of an aneurysm into the chambers of the heart involves an unfavorable prognosis.] Two of the 5 patients had a communication from the aorta into the right heart. One of these had lived for at least 7 years without progression of symptoms; the other had symptoms of rapidly increasing cardiac failure and died during operation. In 2 patients the aneurysm of the aortic sinus was complicated by a backflow to the left ventricle, resulting in a hemodynamic condition resembling aortic incompetence. The 5th patient had no demonstrable abnormality of the circulation and only moderate symptoms.

The causes of death in congenital aneurysm of the sinuses of Valsalva were investigated by study of the literature. Death may follow rupture of an aneurysm into the chambers of the heart, compression of the bundle of His, impairment of the aortic valvular function, or secondary bacterial endocarditis. Of 17 patients whose records contained information about the localization and size of the rupture and the time of survival after the rupture, 10 had rupture into the right atrium. In these the time of survival after the acute onset of symptoms ranged from 1 hour to 3 years. Four patients in whom the ruptures measured 8-12 mm. died before the end of the second month. In contrast to this, 4 patients, who survived for more than 1 year, had ruptures measuring 5-6 mm. In 1 patient a small communication was supposed to have been present for a long time, and death occurred 5 weeks after an episode probably representing a rupture of the aneurysm, which widened the communication to its final size of 7 mm. One man, aged 67 years, had complications in the form of fenestration of the aortic cusps and died only 12 days after a small rupture. The size of the rupture seems to be of importance for the prognosis, and the size of the shunt as measured at cardiac catheterization should be a valuable means of determinating the prognosis.

Referral to a cardiac center for a detailed diagnostic study is advisable for patients presenting with sudden precordial pain, dyspnea, and signs of rapidly increasing cardiac failure, if the physical examination reveals a loud systolic/diastolic or continuous machinery murmur located near the lower end of the sternum. A high pulse amplitude and a pistol-shot sound over the femoral artery are usually present. The authors believe that surgical repair of aneurysm of the aortic sinuses is indicated only in the small group of patients in whom an aneurysm has ruptured into the right atrium. This is provided that (1) a considerable left-to-right shunt into the right atrium is present; (2) there are no signs of a complicating interventricular septal defect; and (3) there is no endocarditis, syphilis, or arteriosclerosis.

Lymphoid Polyps (Benign Lymphoma) of the Rectum and Anus. F. Holtz and L. A. Schmidt III. Surg. Gynec. & Obst. 106:639-642 (June) 1958 [Chicago].

So-called benign lymphoma of the rectum is an uncommon, usually solitary, polypoid lesion of the lower rectum or anus, composed of lymphoid follicles which are limited to the mucosa and submucosa. The chief importance of the condition is that it may be diagnosed erroneously as malignant lymphoma. Synonyms for this rectal lesion are lymphoid polyp, polyp of lymphatic tissue, lymphoma, simple lymphoma, abnormal accumulation of lymphoid follicles, primary lymphoid tumors of the rectum resembling internal hemorrhoids, and benign lymphoid hyperplasia of the rectum. All the noncarcinomatous or nonadenomatous polyps of the rectum and anus seen in the department of pathology of the University of Michigan Medical Center from July, 1935, to June 30, 1955, were reviewed. There were 24 cases that met the criteria of "benign lymphoma" or lymphoid polyp. During this same period, 7 examples were diagnosed as malignant lymphoblastoma primary in the rectum. The 24 patients included 16 women and 8 men. The ages ranged from 21 to 64 years, with the greatest concentration in the 4th decade.

Sixteen patients complained of rectal bleeding, which varied in frequency from an occasional streaking of the stool to a loss of one-half cupful of blood with each stool. Constipation was the next most frequent complaint reported by 9 patients; and only 1 patient complained of diarrhea. A mass was detected on routine physical examination in 8 patients, while in 3 others a mass protruded at defecation. Seven patients complained of vague rectal pain. In 8 patients there were concomitant hemorrhoids, and 1 patient had colonic diverticulosis. The polyps varied from 5 mm. to 3 cm. in diameter and occurred from the level of the anal sphincter to 14 cm. above this area. None of the patients had more than 3 polyps. Twenty-one patients could be traced for follow-up. Three had died, from 2 to 14 years after removal of the lesion, of other causes, and there was no evidence of recurrence in these patients. One patient who was alive 20.7 years later had symptoms of recurrence. Seventeen patients are alive and asymptomatic. Histological studies on the lymphoid polyps resulted in the conclusion that these lesions are the result of chronic inflammation, possibly at the site of minor anatomic abnormalities. The authors feel that the term "lymphoid polyp" may be preferable to the term "benign lymphoma."

Auscultation as an Important Aid to the Diagnosis of Fractures. J. C. Colwill and E. H. Berg. Surg. Gynec. & Obst. **106**:713-714 (June) 1958 [Chicago].

The authors add osteophony, as another classical sign present in fractures, to the existing list of local swelling, ecchymosis, deformity, crepitus, and local one tenderness. Except for crepitus, osteophony is the only one which is directly dependent upon the break in the bone, rather than the effect of trauma upon the surrounding soft tissue. Unlike crepitus, or even local bone tenderness, the sign is elicited without manipulation at the fracture site. Only a stethoscope and the percussing finger are required for the test. In general, one subcutaneous bony area distal and one proximal to the site of the suspected fracture are selected. With the stethoscope over one site, the other site is tapped with a force similar to that used in percussion of the chest. The sound heard is compared with that heard over an identical area on the opposite extremity. The sites for auscultation and percussion may be distally removed from the fracture by 1, 2, or more joints. In the case of a fracture, the affected extremity conducts a sound of much less intensity and pitch than that heard on the compared normal side.

The test was applied to 50 normal patients and to 50 consecutive patients with fractures. In every case of fracture of the long bones, other than the impacted fracture of the head of the femur, in which x-ray examination demonstrated solid cortical contact, the test was positive. In all cases of fracture about the ankle joint, the test was negative because of difficulty in applying the test to fragments on either side of the fracture line. In 1 fractured pelvis the test was negative because of adequate cortical contact of at least 1 ramus. The authors conclude that this method of fracture diagnosis, which utilizes the alteration of sound conduction through bone and requires only the stethoscope, might prove useful in mass catastrophe triage.

Failure of Migration of the Rectal Opening as the Cause For Most Cases of Imperforate Anus. A. H. Bill Jr. and R. J. Johnson. Surg. Gynec. & Obst. **106**:643-651 (June) 1958 [Chicago].

The authors studied 70 cases of anorectal anomalies during the past 9 years. In 2 patients an anal opening was present at the usual site, but one of these had a supra-anal stenosis and the other had an atresia of the rectum. In this report the authors discuss a group of 68 infants in whom they found no opening at the usual position of the anus. In 64 of these an opening was demonstrated from the tip of the rectum into the lower bladder or posterior urethra in the male, or into the lower vagina in the female, or else anteriorly placed in the perineum in either sex. In only 4 patients with no opening at the normal anal position did the large intestine end blindly. Studies of the embryologic source material and deductions from their own material suggested to the authors that the rectal opening normally "migrates" as an almost separate entity caudalward during the formation of the septum which divides the cloaca into the urogenital system and the rectum. When the rectal opening reaches the level of the developing perineum, it appears to be moved posteriorly to its normal position where it becomes encircled by the separately formed sphincter ani externus. When this "migration" is arrested and the rectal opening does not reach the normal position of the anus, one should expect to find the rectal opening somewhere along its course. Thus, the concept of "incomplete migration" of the rectal opening is suggested as the probable cause in the majority of cases of imperforate anus.

Other investigators who have reported on large series of infants with imperforate anus also emphasized the fact that one must be prepared to find an abnormal connection between the rectal pouch and the genitourinary tract, the vagina, or the perineum. When an ectopic opening is present and yet goes unrecognized, and the rectum is brought down to the normal anal position without dividing the original opening into the urinary tract in the male or the vagina in the female, the results leave a good deal to be desired. The ectopic opening may be minute or practically microscopic, especially in the male. Yet the authors believe that it must be found and closed by mobilizing the rectal portion downward to form the new opening at the position of the sphincter ani externus. The authors comment on the classification of abnormalities of rectum and anus proposed by Ladd and Gross in 1934, which allows uniformity in reporting cases.

NEUROLOGY & PSYCHIATRY

***Encephalomyelitis Myalgica Epidemica*, a Disease Resembling Poliomyelitis (Epidemic Neuromyasthenia, Benign Myalgic Encephalomyelitis).** O. Gsell. Schweiz. med. Wchnschr. 88:488-491 (May 17) 1958 (In German) [Basel, Switzerland].

The author reports on 3 epidemic outbreaks in Switzerland of a disease resembling poliomyelitis; 1 in a hospital in Frohburg, canton St. Gallen, in 1937; 1 in a military encampment in Degersheim in 1939; and 1 in another military encampment in Erstfeld in 1937. The epidemic in Frohburg occurred in a gynecologic ward and involved 7 nurses, 5 patients, 1 physician, 1 nurse's aid, and 3 contact persons; 3 of the affected persons had pareses, 8 showed the clinical aspect of meningitis, and in 6 with fever the disease was abortive. An acute onset, a febrile course of several days' duration, stiffness of neck and back, leukopenia, normal cell counts in the cerebrospinal fluid (1 or 2 per cubic millimeter and only once 8), and slight reactions to the gold sol test were noted. Headache, pain in joints and limbs, paresthesias, and during convalescence adynamia and lability of circulation were observed. The pareses were manifested by weakness of muscles without absence of reflexes and were associated with severe neuralgia in the affected extremities. Involvement of the air passages with bronchitis and with pulmonary infiltration was notable, but these disturbances cleared up rapidly without complications, and so did the weakness of the muscles. Mild recurrences and neurasthenic secondary symptoms were observed. All the patients recovered without residues. The second epidemic in Degersheim involved 73 young adults, 5 of whom had pareses, 2 had encephalitic symptoms, 12 showed a meningoneuritic aspect, and 54 had mild disturbances of the air passages. The disease was benign and of short duration, with mild fever and complete disappearance of muscular weakness. Neuralgic accompanying symptoms were observed frequently; of the 19 patients with pareses and meningeal symptoms, 10 had intercostal neuralgia and pain extending along the course of the sciatic and trigeminal nerves. Disturbances of the autonomic nervous system, with fatigability, sweating, tremor, and tachycardia, occurred during convalescence. The number of cells in the cerebrospinal fluid varied between 1 and 3 per cubic millimeter in 13 of 17 patients; 6 and 7 cells per cubic millimeter were counted in 2 patients, and an increase to 125 and 250 per cubic millimeter, respectively, was observed in 2 patients with pareses. All 73 patients were able to resume their activities within 3 months. The third epidemic in Erstfeld involved 130 of the 930 persons in the military encampment; 6 had encephalomyelitic disturbances with pareses, 16 had meningeal symptoms, and in 108, with mild disturbances of the air passages, the disease was abortive. The number of cells in the cerebrospinal fluid and the protein content were not increased. There was mild fever which was diphasic in 3 patients. Headache, stiffness of back and neck, myalgia, rhinopharyngitis, bronchitis, sweating, and zones of hyperesthesia were observed. The pareses were mild and disappeared within 2 to 4 weeks. All patients recovered, but some of them were ill for 5 weeks.

These epidemics were similar to those which were observed in other countries, such as Iceland, England, South Africa, Australia, and the United States, and for which various terms, such as "disease simulating or resembling poliomyelitis," Iceland disease, Akureyri disease, epidemic neuritis, benign myalgic encephalomyelitis, and epidemic neuromyasthenia, were used. The authors prefer the term "epidemic myalgic encephalomyelitis," since the disease was benign only insofar as there were no deaths. All virologic studies gave completely negative results. In contrast to poliomyelitis, abnormal changes in the cerebrospinal fluid were also absent as a rule. There was no evidence of muscular atrophy, and tendon reflexes were within normal range.

***Thrombosis of the Internal Carotid Artery* Simulating an Intracranial Space-Occupying Lesion.** E. Clarke and P. Harris. Lancet 1:1085-1089 (May 24) 1958 [London].

Thrombotic occlusion of the internal carotid artery may present many different clinical pictures. The authors report the histories of 5 patients, in whom an intracranial space-occupying lesion was simulated. Cerebral tumor had been diagnosed in 4 of these patients and a cerebral abscess in 1. The first symptoms are produced by gradual encroachment on the lumen of the internal carotid artery, resulting in the syndrome of intermittent carotid insufficiency. Initially the transient ischemia does no permanent damage to the brain, but an area of infarction is eventually produced. There are often

2 stages in the development of the picture: (1) the progressive or intermittent appearance of focal symptoms and (2) the features of a space-occupying cerebral lesion, which usually necessitate admission to hospital. The usual history is one lasting weeks or even years, characterized at first by persistent headache, which is also a common feature in other types of carotid thrombosis, but as in 1 patient of this series headache may be absent. Focal or generalized convulsions and progressive weakness and paresthesia of the limbs on 1 side, mainly in the arm, often appear, and, if the dominant hemisphere is involved, dysphasia will be added. The defects of speech and limbs may appear in attacks, with complete recovery between them; and these episodes, which presumably result from transient cerebral ischemia, may closely simulate focal epileptic attacks. Eventually permanent signs appear. There is also impairment of mental state, and this too may be progressive or intermittent and may be related to disturbance of language function when the dominant hemisphere is involved.

On examination in the second clinical phase, all the signs of a cerebral tumor may be discovered. The patient may be drowsy, and papilledema is often present. As in 3 of the patients presented here, the papilledema may be bilateral and at times greater on the side of the affected cerebral hemisphere. Not only the symptoms and signs but also the abnormalities in the roentgenogram, in the cerebrospinal fluid, and in the electroencephalogram may be identical with those due to a space-occupying lesion; and an incorrect diagnosis of cerebral neoplasm, cerebral abscess, or traumatic intracranial hemorrhage may be made. Only carotid angiography permits definite differentiation.

Treatment should, if possible, be carried out before complete arterial occlusion takes place, but 's is only occasionally feasible. Medical meas- s, such as antispasmodic and anticoagulant rugs, have not been very effective in the chronic or the acute phases of the disease, and anticoagulants are thought by some to be contraindicated in view of possible hemorrhagic complications in the brain. A surgical approach seems to be more profitable.

Further Investigations of the Antigenic Activity of British Poliomyelitis Vaccine: Reports to the Medical Research Council. F. T. Perkins, E. J. C. Kendall, T. S. L. Beswick and others. Brit. M. J. 1:1206-1209 (May 24) 1958 [London].

The effect of a third dose of poliomyelitis vaccine given 18 months after primary immunization was studied in England in a group of 21 children who originally had no antibodies to any of the 3 types of poliomyelitis virus. It was shown that the children produced to all 3 components of the vaccine substantial antibodies which were similar to those produced by children who received their third dose 8 to 11 months after primary immunization. The decline in antibody levels during the 18-month period between the primary and third doses was least in titers to type 2, and this type gave the best response to the third dose.

The serologic response to poliomyelitis vaccine was studied in another group of 152 persons, whose ages ranged from 13 to 50 years and who, before receiving vaccine, had no antibodies to any of the 3 types of poliomyelitis virus. Two injections of vaccine were given at an interval of 4 weeks, and antibody levels were determined 2 weeks after the second dose. Antibody titers of 1:4 or greater were produced by all persons to types 2 and 3 and by all except 12 to type 1.

Neurologic Disorders After Asian Influenza. F. A. Horner. New England J. Med. 258:983-985 (May 15) 1958 [Boston].

The author reports on a 20-year-old woman, 2 boys, aged 8 and 16 years, and 2 girls, aged 3 and 14 years, who were convalescing from Asian influenza and in whom certain neurological syndromes arose. The older boy and the 2 girls presented many clinical features in common. In each, progressive lethargy, irritability, and stupor occurred within a few days of recovery from Asian influenza. The encephalopathies in these 3 patients were characterized in their most severe stage by evidence of decortication. Despite the clinical similarity, the outcome was quite variable. The 16-year-old boy recovered completely except for a mononeuritis involving the posterior interosseous nerve. The younger girl recovered but showed marked mental and motor change. The older girl died, and autopsy revealed extensive but patchy demyelination of the central nervous system; a virus having the properties of an Asian strain of type A influenza virus was isolated from her lungs but not from the central nervous system. The younger boy presented a syndrome not uncommon in children, for which the terms "acute cerebellar ataxia" and "acute ataxia of unknown causation" have been used by other workers. The adult patient showed the aspect of a disseminated encephalomyelitis; the possibility of a compressive lesion of the spinal cord was entertained because of the severe back pain in association with the transverse myelitis. However, no block was demonstrated by the manometric response of the spinal fluid, and no exudate was obtained on aspiration of the spinal epidural space. The patient was given prednisone in doses of 10 mg. every 6 hours, but first she remained paraplegic, with hyperactive deep tendon reflexes, and the cranial nerve involvement persisted. Clinical improvement began 6 days after the institution of steroid therapy.

The hemagglutination inhibition against Japanese 305/57 virus is a specific serologic test for the virus of Asian influenza. The marked elevation of titers for both complement fixation and hemagglutination inhibition in the 4 surviving patients clearly indicated that these patients were recovering from Asian influenza. Although the early death of the 14-year-old girl precluded diagnosis by serologic tests, the virus isolated from the lungs showed the laboratory properties characteristic of an Asian strain of type A influenza virus. The clinical, laboratory, and autopsy data in these 5 patients support the concept that influenza virus infections may be followed by disorders in the central nervous system. It appears that Asian influenza can cause serious morbidity and even death by a reaction in the central nervous system to the infection.

Alcoholic Gasserian Injection for Relief of Tic Douloureux: Preliminary Report of a Modification of Penman's Method. A. Ecker and T. Perl. Neurology 8:461-468 (June) 1958 [Minneapolis].

Penman described a method of injecting the posterior root of the gasserian ganglion under roentgenographic control. Preliminary roentgenographic study determined the entry point of the needle and the required relationship to the individual patient's skull, further roentgenographic study indicating the position of the needle in the base of the skull and permitting accurate adjustment of its depth. The effect of injecting a minute amount (0.03 cc.) of procaine was judged by careful sensory testing in order to deduce the exact relation of the needle to the posterior root before minimal amounts (0.05 cc.) of absolute alcohol were injected. Penman was able to produce immediate relief of tic douloureux in 97 of his first 100 patients, although 82 later suffered from corneal anesthesia and 15 required tarsorrhaphy because of keratitis. The authors have minimized the risk of involvement of the opthalmic fibers by modifying Penman's method to the extent that the patient now lies in the supine position with the face up. The method of insertion of the needle was simplified and defined more precisely, and some additional sensory observations were made after injection. The analgesia produced with the modification was that quantity just sufficient to relieve pain, thus lessening the extent of numbness and the incidence of late disturbing paresthesias.

This office procedure has been used over a period of 3 years to treat 45 successive patients with tic douloureux (classical trigeminal neuralgia). Seven of the patients had had previous surgical rhizotomy for this condition; 1 had had no relief, and the remaining 6 obtained temporary relief, with recurrence of pain. Numbness was produced in all 45 patients, and pain was relieved completely, at least temporarily. Insufficient alcohol was injected into the correct portion of the posterior root in 9 patients, and pain recurred. Another injection was made in 6 of these patients within 6 months. In the remaining 3 patients pain had recurred after 27, 10, and 11 months respectively. A review of the films of the first 7 of these 9 patients showed that the needle position was not correct in 4. One patient experienced very severe and frequent pain as well as 2 unusual features: (1) overlap of touch sensation and (2) an unexplained delay of a few days in the relief of his tic pain. There were no serious complications in any case, save for headache and late painless labial herpes. Total permanent loss of corneal sensation was produced in 7 patients (16%), but in no instance has it led to keratosis or required tarsorrhaphy. In one patient there was impairment of accommodation and enlargement of the pupil for 2 days, another patient experienced abducens palsy for a few minutes, and a third patient exhibited nystagmus and 7th nerve paralysis momentarily. A hematoma developed in 2 patients but did not increase in size, and the intracranial injection was accomplished with no untoward results.

GYNECOLOGY & OBSTETRICS

Contribution to the Anatomoclinical Study of Fetal Deaths: Lesions of the Central Nervous System (On the Basis of 26 Cases). J. Chosson, H. Payan, Mrs. M. Bérard-Badier, G. Zographos and T. Mangiapan. Presse méd. 66:893-896 (May 21) 1958 (In French) [Paris].

Macroscopic and microscopic studies showed that lesions of the central nervous system were present in 25 infants and 1 fetus in whom death occurred in utero, during labor, or shortly after birth. Hemorrhages, found in 10 of the 17 born prematurely and in 4 of the 9 born at term, predominated. Other but less frequent findings were various types of congestive and infiltrative lesions, calcareous or pseudocalcareous deposits, thickening of the medullary leptomeninges, and hydrocephalus. General conclusions in regard to the deaths of newborn infants cannot be drawn from the findings in these cases, but they do provide a basis for certain observations. 1. The anatomic lesions seem to be related to a combination of several factors, and it is usually hard to say which of these factors is predominant. Essentially, they are of 3 kinds: (1) the pathological conditions of pregnancy; (2) placental changes, usually evidenced by microscopic lesions in the placenta; and (3) the unfavorable circumstances accompanying labor, chief among which is the fetal anoxia that leads to cerebromeningeal vascular congestion. 2. A thorough autopsy will usually provide an explanation for the death, but in most cases the explanation will be incomplete because of the difficulties encountered in trying to arrive at the exact cause. It is not always possible, for example, to say whether a meningeal hemorrhage was caused by trauma or whether it is merely an accompanying lesion. Similarly, it may be difficult to determine the part played in the death of the infant by severe disease in the mother. Finally, the exact causes of defects in the ovum, of hydramnios, and of malformations cannot as a rule be determined.

3. Purely mechanical and obstetric causes become increasingly evident as the birth weight rises. Difficult forceps deliveries and fetopelvic disproportion are much more important in infants with higher birth weights, but even here it is not always easy to determine the part due to trauma and that due to preexisting fragility. An excellent example of these difficulties is provided by a case characterized by maternal tuberculosis, fetal distress, forceps delivery, and cerebral lesions of the meningeal and intraventricular type with a nonspecific perivascular inflammatory reaction. 4. Visceral vasodilatation found after maternal hibernation or infantile disconnection suggests that hibernation should be reserved for severe cases in which the advantages of the procedure outweigh its dangers. Largactil given in small doses for short periods, e. g., during labor, presents no danger. Complications, however, must be expected if it is given in larger doses and for fairly long periods. 5. Malformations for which no cause could be found were observed in 8 of the 26 infants, or a little less than one-third of the cases. Obstetricians should be on e alert for curable malformations; some of these not clinically apparent, but they must be detected early if they are to be operated on in time.

Cervical Pregnancy: A Case Report. H. W. Mayberger. Obst. & Gynec. 11:657-660 (June) 1958 [New York].

The patient was a 24-year-old woman who had had a normal delivery in May, 1955. In March, 1956, an ectropion of the cervix was cauterized. A Papanicolaou smear was reported negative. The patient gave a history of having had her last period on Aug. 12, 1956. She had been in an automobile accident on Nov. 6 and was emotionally disturbed. On Nov. 20 she had a desire to defecate and began to bleed. This became more pronounced, and she had a sudden gush of clear fluid from the vagina. The following day she passed a nonmacerated fetus. The cord was severed. Bleeding suddenly became brisk, and she was hospitalized because shock threatened. After blood replacement and with the patient under intravenous Pentothal sodium anesthesia, a speculum was inserted into the vagina, and many clots were evacuated. The cervix filled the upper vagina and was cup-like in appearance. Occupying about two-thirds of the ballooned-out cervical canal was the placenta, which came to within 1 cm. of the external cervical os on the left and extended upward just beyond the midline on the right. The placenta peeled away with little more difficulty than would be expected from a normally implanted one. A finger was introduced with ease and without dilatation into the endometrial cavity, which was found to be small and empty. The patient's postoperative stay was uneventful.

Cervical pregnancy is rare and almost always terminates in early spontaneous abortion. Early recognition is essential, since complications may be sudden, severe, and fatal. Vaginal bleeding, usually painless, is the chief complaint, and because of the paucity of cervical musculature, with the consequent inability to contract, profuse hemorrhage usually follows any attempt at removal of the placenta. Trophoblastic invasion frequently causes rupture of the cervix. Treatment is directed primarily at hemorrhage and shock and varies from careful observation to total hysterectomy. Death may occur in 20% of cases.

Pulmonary Hyaline Membrane Contamination of the Lungs by Fluid of the Birth Canal: Studies in Rabbits Demonstrating a Hazard of Obstetric Analgesia. F. F. Snyder. Obst. & Gynec. 11:599-616 (June) 1958 [New York].

he author attempted to investigat to wha extent the fluid and cells of birth canal are present in the lungs rabbit fetuses which died during labor or soon afterward, following administration to the mother of an analgesic agent such a meperidine (Demerol), alphaprodine (Nisentil) methadone, or various morphine derivatives. Autopsies were performed on 281 rabbits born at ful term, of which 194 were stillborn and 87 were alive at birth but died within 24 hours. The animals belonged to 130 litters in which at least 1 death occurred during labor or shortly afterward; the total births were 597, among which 312 fetal o neonatal deaths occurred. The analgesic agent were administered to the mother during labor a 31 days. The lungs were contaminated with blood epithelial cells, and amorphous debris in 95% of th 281 autopsies. Large areas of the alveoli and bronchioles of both lungs were involved in 56% of th autopsies. Autopsies were made also on a contro group of 164 newborn rabbits, the total numbe born in 30 consecutive litters. These were killed b chloroform inhalation within 12 hours after birt There were no fetal or neonatal deaths in these 3 litters in which no drugs were administered. Th lungs of these control animals showed only mino amounts of erythrocytes and cellular debris in th air passages; there was no massive contaminatio of the air passages, such as occurred in more tha half of the perinatal deaths.

The entrance of the fluid and cellular debris of the birth canal into the air passages demonstrates fetal respiration during the second stage of labor. Increase in the duration of labor is accompanied by increase in the contamination of the air passages. The demonstration of fetal respiration during labor affords a clue to the origin of pulmonary hyaline membrane. The entrance of the contents of the birth canal into the fetal air passages during labor accounts for the foreign matter in the lungs of the newborn rabbit; the displacement of the eosinophilic matter in a membrane-like layer along the walls of the alveoli and broncioles results from the expansion of the airpassages with the entrance of air. The foreign cellular debris in the lungs of litter mates expelled through the same birth canal is strikingly similar; however, dispersion of it in the form of a film does not occur in the stillborn animal. Atelectasis occurs in regions of the lungs which show membrane-like distribution of the foreign matter. The action of the analgesis drugs during labor on the fetus involves narcosis, anoxemia, prolonged exposure in the birth canal, and contamination of the air passages.

PEDIATRICS

The de Toni-Fanconi Syndrome with Cystinosis: Clinical and Metabolic Study of Two Cases in a Family and a Critical Review on the Nature of the Syndrome. H. G. Worthen and R. A. Good. A. M. A. J. Dis. Child. 95:653-688 (June) 1958 [Chicago].

The de Toni-Fanconi syndrome, which is a clinical constellation characterized by resistant rickets, acidosis, glycosuria, hyperaminoaciduria, and organic aciduria, belongs to a group of diseases based on abnormalities in renal tubular function. The renal abnormality in patients with the de Toni-Fanconi syndrome consists of a deficient tubular reabsorption of phosphorus, amino acids, and glucose along with a deficiency in the tubular mechanism for reabsorbing base without acid. The presence of cystinosis in two patients with this syndrome, who belonged to the same family, was diagnosed during life by the demonstration of typical cystine crystals in the bone marrow and the cornea. Both patients developed acidosis and rickets at an early age.

The first patient failed to respond to therapy until very large doses of base and vitamin D were given, although after the rickets had healed the large dosage of vitamin D caused hypercalcemia. This patient died during the course of an upper respiratory infection, which was complicated by an electrolyte disturbance in which hypopotassemia, hypercalcemia, and acidosis predominated. The second patient has done quite well save for moderate dwarfism and minimal rachitic stigmas. Despite x-ray evidence of healing of the rickets, the chemical abnormalities of this disease persisted until massive dosage of vitamin D was instituted. The acidosis has continued to be resistant to therapy, and the plasma bicarbonate level has remained low in spite of massive doses of sodium and potassium. However, after intensive vitamin D therapy was instituted, the acidosis improved, and the amount of extra cation required to keep the serum bicarbonate level within normal limits was sharply reduced. Both patients had an almost constant glycosuria, and fasting blood sugar levels indicated that the glycosuria was renal in origin. Both patients had hyperaminoaciduria, and studies of individual amino acid excretion, carried out with filter-paper chromotography, detected 10 amino acid spots in contrast to the 3 or 4 spots found in normal urine. Increased organic aciduria was detected in both patients by the titration technique of Van Slyke and Palmer. Since the unmeasured anion fraction of the plasma was usually within normal limits, the organic aciduria is postulated as being due to decreased tubular reabsorption of filtered organic acids rather than to an increased plasma level. Despite the low levels of serum phosphorus, both patients had relative hyperphosphaturia. The second patient demonstrated absolute calciuria and phosphaturia. Since the de Toni-Fanconi syndrome in patients without cystinosis is similar to the syndrome which accompanies cystinosis, it is conjectured that the de Toni-Fanconi syndrome occurring without cystinosis is due to an inhibition of the sulfhydryl dependent enzymes by a different oxidizing agent which has an action similar to that of cystine. If sulfhydryl inhibition is the basis for the tubular abnormality, the possibilities of developing effective therapy are much more promising.

Comparison Study: Silver Nitrate and Oxytetracycline in Newborn Eyes: A Comparison of the Incidence of Conjunctivitis Following the Instillation of Silver Nitrate or Oxytetracycline into the Eyes of Newborn Infants. P. L. Mathieu Jr. A. M. A. J. Dis. Child. 95:609-611 (June) 1958 [Chicago].

Since the introduction of the Credé procedure for preventing ophthalmia neonatorum with silver nitrate, antibiotics have become available which are more effective against both gonorrheal and other ocular infections common in the newborn infant. The changing pattern of maternal infections since the advent of the sulfonamides has resulted in some instances in a reduction of gonorrheal infections and a relative increase in the incidence of other pathogens. The ability of penicillin to evoke sensitization reactions upon topical application limits its value in prophylaxis. In view of the diversity of pathogens that may be encountered in neonatal conjunctivitis, it is conjectured that a broad-spectrum, nonsensitizing antibiotic might afford the infant more satisfactory protection. Oxytetracycline was selected for a trial substitute for silver nitrate, as it is effective against the great majority of organisms that cause neonatal conjunctivitis, has been used successfully in treating inclusion conjunctivitis, does not irritate the eyes as does silver nitrate when administered locally, and topical application does not sensitize patients to subsequent systemic administration of the preparation.

Oxytetracycline was used alone in 908 infants, and silver nitrate was used alone in 106 infants. In the remaining 125 of a total of 1,139 infants, oxytetracycline was used in one eye and silver nitrate in the other eye. Of the 106 infants given the conventional Credé treatment with 2% silver nitrate, a discharge was present with inflamed eyes or the lids were swollen in 46% of the infants on the first day after instillation. The incidence decreased steadily through the 5th day, no discharge remaining in the eyes of any infant by the time of examination 6 weeks later. The 908 infants given oxytetracycline showed a much lower incidence of discharge throughout the first 5 days. The highest incidence (8.8%) occurred on the 2nd day, the incidence falling steadily to 0.4% on the 5th day. None of the 846 babies of this group seen 6 weeks later had any evidence of opthalmic inflammation. The third group of infants given silver nitrate in one eye and oxytetracycline in the other permitted a rigorous comparison of the 2 drugs. In this group oxytetracycline was associated with a lower incidence of inflammatory reactions, and the only instance of a frankly purulent discharge from which pneumococcic organisms were recovered was in an eye in which silver nitrate was used. At some time during the first 5 days 6% of those given oxytetracycline were affected, compared with 46% of those given silver nitrate.

BCG Vaccination of Prematurely Born Infants. F. Eckardt. Monatsschr. Kinderh. 106:261-263 (May) 1958 (In German) [Berlin].

It is generally known that the tuberculin sensitivity of very young infants is considerably less than that of older children. For this reason it is surprising that after BCG vaccination a high percentage of premature infants show a positive tuberculin reaction. However, this positive reaction is only a reflection of the desired effect; it is not an exact indicator of the formation of antibodies. Nevertheless, tuberculin tests are now generally accepted as indicators of the efficacy of BCG vaccination. The author has used BCG vaccination since 1954 in prematurely born infants. The vaccination was not carried out immediately after birth but while the infants were still receiving care for prematurity, that is, while they were only a few weeks old. The vaccination was carried out by producing 2 wheals on the left upper arm. The efficacy of the vaccination was ascertained by tuberculin tests, which were given at different intervals after the vaccination. Since many of the infants were from rural regions, the follow-up often left something to be desired. Thus, when the percutaneous tests proved negative, it was not always possible to carry out repeated intracutaneous tests.

The author reports on 140 premature infants who were vaccinated with BCG. The tuberculin reaction became positive after vaccination in 132 (or 94.3%), and it remained negative in 8 of the premature infants. The negative outcome of the test seems to depend mostly on the extremely young age and not on the weight of the premature infants, because all 8 negative tuberculin reactions occurred in infants who were vaccinated before they were 8 weeks old. The interval between vaccination and testing likewise seemed to be of no importance in the outcome of the test. No undesirable secondary effects resulted from the vaccination. The author concludes that BCG vaccination of premature infants is promising in that it protects infants against tuberculosis before they are discharged from the premature station and thus reduces the period of dangerous exposure to tuberculous infections.

Quantitative Tests on the Sensitivity to Antibiotics of Escherichia Coli Strains Isolated in 1957. L. Tóth and A. Vörös. Monatsschr. Kinderh. 106:251-253 (May) 1958 (In German) [Berlin].

In the Children's Clinic in Pécs, Hungary, intestinal infections due to Escherichia coli became increasingly resistant to antibiotics. More and more children with such infections failed to respond to antibiotics, so that in 1957 an institutional epidemic developed. The authors made studies on strains that had been isolated in 1950, in 1956, and during the 1957 epidemic. The strains were identified on the basis of their O, B, and H antigens by means of agglutination. The quantitative sensitivity to streptomycin, Chloromycetin, Aureomycin, Terramycin, and neomycin was ascertained by means of in vitro dilution tests. A total of 157 strains of E. coli were studied.

The strains that had been isolated in 1950-1951 were still without exception sensitive to the broad-spectrum antibiotics, but from then on resistant strains gradually emerged. The strains that were isolated during the epidemic of 1957 proved resistant to streptomycin, Chloromycetin, Aureomycin, and Terramycin and were sensitive in vitro only to neomycin; this corresponded to the clinical experiences. A number of other investigators also found neomycin effective in children with dyspeptic-diarrheal disturbances caused by E. coli strains. The authors feel that the development of resistance to antibiotics is chiefly due to administering an antibiotic without first ascertaining its efficacy, continuing its use for prolonged periods, and giving an antibiotic in low, ineffective doses.

Metastatic Embryonal Rhabdomyosarcoma in the Growing Skeleton: Clinical, Radiographic, and Microscopic Features. J. Caffey and D. H. Anderson. A. M. A. J. Dis. Child. 95:581-600 (June) 1958 [Chicago].

Five children, all of whom had primary malignant tumors located in muscles and who presented the microscopic picture of embryonal rhabdomyosarcoma and scattered metastases in the skeleton which were identified roentgenographically, were studied. There were 4 boys and 1 girl, ranging in age from 2½ to 11½ years of age. The first sign of disease in 3 of the patients was the appearance of the primary swelling—located in the dorsal part of the thoracic wall in one, in the foot in another, and in the orbit in the third. In the 2 remaining patients, pain and limitation of motion at the sites of secondary tumors in the skeleton—in a shoulder in one and in the lumbar spine in the other—were the primary clinical manifestations. In these 2 patients, primary tumors had been overlooked at earlier examinations. Roentgenographically, skeletal changes of these metastatic rhabdomyoscarcomas were almost exclusively destructive, and they resembled the skeletal findings of neuroblastoma, both in the character of single lesions and in the pattern of distribution in different bones. The spine was affected more frequently and more extensively in these rhabdomyosarcomas than in neuroblastomas.

Characteristic changes in the blood and bone marrow smears readily differentiate multiple leukemic bone lesions from those of metastatic skeletal rhabdomyosarcomas. Phosphatase activity was increased to 41 and 44 Bodansky units, respectively, in 2 cases, and the erythrocyte sedimentation rate was accelerated in 2 cases. Biopsy specimens of the primary and metastatic lesions and tissue culture of microscopic sections provide the only means of satisfactory conclusive diagnosis, although the tumor may differentiate between the time of the initial biopsy and a later biopsy or postmorten examination. The identifying histological features are the pleomorphism, the pattern of nests of cells in the lacunae of a network of collagen fibers, the irregular bosselated appearance of the nuclei in less well-differentiated cells, the presence of fuchsinophil granules in many of the cells, the row of small cells along the trabeculae, and the lack of a basement membrane. External irradiation was effective in the 4 patients in whom it could be used satisfactorily. The fifth patient did not respond to irradiation, and death occurred shortly after the institution of such therapy. Pain, tenderness, muscular spasm, and limitation of motion were all improved after a few days of radiation therapy, and it provided pain-free existence for patients suffering from excruciating bone pain. Relapses occurred in all cases 6 to 8 weeks after therapy had begun; radiation became ineffective, and new skeletal tumors appeared and grew rapidly in the sites of irradiation. Cortisone provided some relief in 1 patient for an initial period of several weeks. Recognition of and accurate classification of various types of metastatic embryonal rhabdomyosarcoma are essential for better knowledge of the course and pathogenesis of this neoplasm and are important from the standpoint of developing specific chemotherapeutic agents against this entity.

Hyaline Membranes in the Lungs of Newborn Infants. W. H. Brummelkamp. Nederl. tijdschr. geneesk. 102:662-668 (April 5) 1958 (In Dutch) [Amsterdam].

In connection with the case of a newborn infant, who died 5 hours after birth and in whom hyaline membrane was found in the lungs, the author reviews the literature on this condition and describes the results of pathological studies carried out on 45 prematurely born infants with hyaline membrane in an Amsterdam hospital. He emphasizes that hyaline membranes are found almost exclusively in 2 groups of newborn infants, namely, (1) in premature babies and (2) in full-term children born by cesarean section or in breech presentation, as well as twins and infants with hemorrhages into the ventricles. Hyaline membranes have their origin in a transudate arising from the immature lung tissue of premature babies, which is unable to adjust itself to postnatal changes in the pulmonary circulation. The development of transudation and hyaline membranes in fully developed children might be explained by the hypothesis that the absence of physiological compression of the cranium, which is commonly seen in twins and in many children born by cesarean section or breech presentation, results in insufficient stimulation of the cerebral centers of the parasympathetic vasomotor nerves, whereas ventricular hemorrhage causes overstimulation.

OTOLARYNGOLOGY

Laryngeal Stridor in Rheumatoid Arthritis. C. S. Darke, L. Wolman and A. Young. Brit. M. J. 1:1279-1282 (May 31) 1958 [London].

The authors report on 2 men and 3 women, between the ages of 57 and 67 years, with advanced rheumatoid arthritis in whom laryngeal stridor occurred. The onset of this complication occurred when the generalized joint disease appeared to be quiescent. Tracheotomy became necessary in 4 patients. Two of the patients died, and autopsy was performed on both. It revealed indisputable evidence of nerve degeneration and mobile cricoarytenoid joints, even though chronic inflammation of the joints was present in 1 patient. In the second patient the microscopic changes in the nerves appeared to be due to ischemic neuritis resulting from a rheumatoid type of arteritis of the vasa nervorum. The difficulty of distinguishing between an arthritis of the cricoarytenoid joints leading to stridor and a bilateral abductor paralysis of the vocal cords is emphasized. Clinical examination may not provide sufficient evidence, and in the final analysis microscopic examination of the joints, muscles, and nerves is needed. Although in patients with rheumatoid arthritis in whom laryngeal stridor occurs involvement of the cricoarytenoid joint may be responsible, it is not the only factor, and nerve degeneration leading to abductor paralysis can be the cause.

Complications of Mastoiditis in the Antibiotic Era. R. C. Morrow. Ann. Otol. Rhin. & Laryng. 67:41-60 (March) 1958 [St. Louis].

The author's own observations and the literature reports indicate that dangerous complications of mastoiditis are continuing to occur. Often they are the penalty of reliance on antibiotics alone in earlier stages of the disease. Once they occur, they may be insidious and difficult to diagnose under the cloak of antibiotic therapy. It appears wise to go ahead with mastoidectomy if any of the classical signs of acute mastoiditis are present, such as postauricular swelling, mastoid tenderness, sagging of the posterior canal wall, or x-ray evidence of bony breakdown. This statement is made in spite of the fact that the author's own series included 22 patients with acute and subacute mastoiditis treated with antibiotics alone. Unanticipated intracranial extension was sometimes found at operation. Surgical treatment is indicated when acute mastoiditis has subsided after antibiotic therapy, but there still is a lingering and unexplained malaise, low-grade fever, anemia, leukocytosis, pain in and around the ear, headache, or vertigo.

In meningitis associated with otitis media, the possibility of mastoid surgery should be kept constantly in mind and becomes indicated when the patient's progress is not prompt and satisfactory. A nonsurgical management with intensive antibiotic therapy appears justified when the meningitis and the otitis are of simultaneous onset. If, however, an ear infection seems to respond well to antibiotics but is followed in a week or more by meningitis, a masked mastoiditis should be suspected, whether or not there is recurrent otorrhea, and surgery becomes advisable. At least 3 groups of meningitis cases call for consideration of mastoid surgery: (1) those with delayed onset in the course of acute otitis media; (2) those with early onset in acute otitis media but resistant to antibiotic therapy; and (3) those developing in the course of chronic otitis media. The proper control of chronic otitis media is an important feature in the prevention of dangerous complications. Situations demanding prompt surgical interventions must be differentiated from ordinary exacerbations in the chronic problems, in which delay is permissible, conservative treatment worthy of trial, and surgery scheduled when convenient.

In the presence of an acute exacerbation of chronic otitis media, certain features must be taken as warnings of serious complications. Pain in the ear, in a patient whose usual exacerbations are painless, is a danger sign. Pain above and behind the ear is even more significant. Mastoid tenderness, and especially tenderness superoposteriorly to the mastoid, should be given serious weight in a chronic case. Headache, even if only frontal, is important. General malaise, listlessness, anorexia, slight temperature elevation, and slight leukocytosis should be looked on with suspicion. Even mild degrees of vertigo or ataxia, changes of mentation, or clouding of consciousness should be respected. *Above all, the observer should follow up even subtle suspicions with adequate neurological examination, lumbar punctures, electroencephalography, and other studies and should be ready to operate on slight evidence.*

THERAPEUTICS

Buccally Administered Streptokinase: Clinical and Experimental Observations. I. Innerfield, H. Shub and L. J. Boyd. New England J. Med. 258-1069-1074 (May 29) 1958 [Boston].

Enzyme therapy has been identified as "a new avenue of therapeutic approach to the problems of thromboembolism and inflammation." Several workers have investigated the possibility that the anti-inflammatory effect of proteolytic enzymes is due, in part, to their effect on tissue permeability. The implied interrelation between proteolytic action on connective tissue and increased tissue permeability suggested that proteolytic enzymes could be administered buccally by placing a protease tablet or lozenge against the surface of the buccal mucosa. This report is concerned with the buccal administration of the enzyme, streptokinase. Laboratory studies were made on selected diabetic patient. Bleedings were obtained for 10 consecutive weeks. The first 4 weeks comprised a control period. Tablets containing 20,000 units of streptokinase were given buccally 4 times daily to each patient during the next 6 weeks. The Ouchterlony gel-diffusion technique was utilized for demonstrating specific antibodies. The method for determining serum antithrombin levels with the use of a human thrombin preparation is described. Complete and differential blood cell counts, urinalyses, prothrombin and fibrinogen determinations, and determinations of bleeding and coagulation times were carried out each week.

Clinical studies were made on 74 patients, of whom 51 presented evidence of recent trauma or acute inflammation, including hematoma, cellulitis, abscess, upper respiratory infection, and thrombophlebitis. Twenty-three patients had chronic thrombotic or inflammatory conditions, or both, such as indolent leg ulcer, retinal vein thrombosis, chronic bronchitis, and bronchiectasis. Tablets containing 20,000 units of streptokinase activity were administered by the buccal route every 4 hours for from 1 day to 14 weeks. Each patient was instructed to retain the tablet either sublingually or in the buccal pouch. Several illustrating histories are presented. Experimental and clinical evidence was obtained that buccal administration of streptokinase in tablet form results in mucosal penetration, enhanced serum antithrombin activity, and impressive anti-inflammatory effects. Enzyme therapy can now be used in the long-term management of chronic bronchitis, bronchiectasis, retinal vein thrombosis, indolent leg ulcer, acne, and migratory phlebitis.

The mechanism underlying the anti-inflammatory or thrombolytic effects of protease remains speculative. The capacity of streptokinase to participate in the conversion of plasminogen to plasmin is probably related to the phenomena of clot lysis and reversal of inflammation. So far as buccal administration is concerned, the abundance of salivary plasminogen provides a substrate for the streptokinase-plasminogen interaction. Immunological data obtained imply that one of the most anti-inflammatory effects induced by buccal administration of streptokinase is the elicitation of specific antistreptococcic antibodies. Buccal streptokinase therapy provides an effective and simple means for reversing inflammation. Side-effects are minimal. No local irritative signs developed in the mouth in any of the 74 patients comprising the "clinical" phase of this study or in the 14 patients constituting the "laboratory" phase. The sole systemic side-effect was an occasional mild gastrointestinal disturbance of brief duration.

Chloramphenicol Combined with Tetracycline in the Treatment of Brucellosis. M. Parravicini. Riforma med. 72:477-479 (April 26) 1958 (In Italian) [Naples].

Sixteen patients, 21 to 52 years of age, with brucellosis due to Brucella melitensis were treated with chloramphenicol combined with tetracycline for a period of 7 to 24 days. The values of the Widal-Wright agglutination test were high before this treatment began. Daily oral dosage of the combined treatment consisted of 800 mg. of chloramphenicol and 400 mg. of tetracycline. Some patients received daily dosages of 2.4 Gm. of chloramphenicol and 1.2 Gm. of tetracycline at the beginning of this study. Since the higher dosage produced approximately the same results as the lower dosage, subsequently the lower dosage was given to all patients.

Remission of fever developed within 2 to 6 days after onset of this chemotherapy in all the patients, including 2 in whom the disease tended to become chronic. These 2 patients had previously been treated with penicillin and chlortetracycline (Aureomycin) without benefit. Relapse of fever developed in only 1 patient 30 days after the beginning of the treatment. Combined action of chloramphenicol (daily dosage of 1.2 Gm.), tetracycline (daily dosage of 600 mg.), and vaccine therapy produced remission of fever in this patient in 5 days. A severe form of herpetic stomatitis was associated with brucellosis in 1 patient; chemotherapy brought about complete remission of the former after 3 days of treatment. After remission of fever, vaccine therapy administered intravenously was instituted in addition to the main chemotherapy in one-half of the patients, in whom the disease was in an advanced stage. No significant difference in results was observed between the patients who received the additional vaccine therapy and those who did not. The patients were followed up for a period of 5 to 9 months after remission of the disease. The treatment was well tolerated.

Gangrene of the Extremities Following Cardiac Infarction and Noradrenaline Therapy. D. Greenbaum. Lancet 1:1103-1104 (May 24) 1958 [London].

A 56-year-old man was hospitalized 3 hours after he had collapsed with severe substernal pain. His extremities were cold and blue, his skin was pale and clammy, and his temperature was 95.5 F (35 C). The pulse was feeble. Electrocardiography showed gross ST and T changes in all leads and a complete heart block. Four hours after admission there was no change in the patient's general condition and blood pressure, and an intravenous infusion of arterenol, 1:200,000 in 5% dextrose, was begun. The concentration was increased to 1:100,000 after an hour to reduce the amount of fluid administered intravenously. The blood pressure rose almost immediately. The pulse rate rose, and electrocardiography showed that the sinus rhythm had returned. The infusion was maintained for 68 hours, after which the blood pressure remained normal. The dose of arterenol was 20 mg. on the first, 16 mg. on the second, and 8 mg. on the third day. Toward the end of the third day the peripheral pulses became difficult to feel. On the 4th day the patient complained of stiffness of the fingers of his left hand, and during the next 2 days patches of gangrene appeared on his hands and feet. Thereafter gangrene spread gradually up all 4 limbs. No urine was passed during the first 36 hours. The patient became delirious and progressively weaker. He died 14 days after admission. The blood urea level on the day of death was 212 mg. per 100 cc.

Autopsy revealed extensive cardiac infarction. The whole of the posterior wall of the right ventricle, the posterior two-thirds of the interventricular septum, and the whole of the posterior wall of the left ventricle were necrotic. The left coronary artery was much smaller than usual, most of the blood supply to the heart coming from the right coronary artery, which was occluded by a thrombus. The limb arteries were apparently free from thrombus as far as the line of demarcation of the gangrene. The liver and the spleen were congested, and the kidneys appeared normal. There was moderate pulmonary edema. Apart from the limbs, the testes were the only organs to show ischemic necrosis. The use of arterenol must have made an important contribution to the vasoconstriction that led to gangrene. The spread of the gangrene for 11 days after the infusion had been stopped indicates the equal or greater importance of the low cardiac output. These 2 factors may explain the remarkable extent of the gangrene. In the other published cases it usually involved little more than the tip of the nose and the digits.

Spiramycin for the Treatment of Chronic Osteomyelitis. E. Marchis and A. Quarta. Riforma med. 72:499-504 (May 3) 1958 (In Italian) [Naples].

Therapeutic results from an Italian proprietary preparation of spiramycin administered to 16 patients and from other antibiotics administered to 8 patients with chronic osteomyelitis were compared. Among the patients of the first group, the disease affected the lower extremities in 12, upper extremities in 3, and hip bone in 1. A dosage of 2.5 Gm. of spiramycin given on the first day of drug treatment was followed by a daily dosage of 2 Gm. given in 4 divided doses for a period of 7 to 10 days. Spiramycin produced almost complete remission of the symptoms of inflammation in 2 patients. Partial regression of inflammation ascribed to spiramycin was obtained in the remaining 14 patients, who subsequently received surgical therapy. Surgical wounds were either completely sutured or a draining catheter was used for 2 to 4 days. Complete clinical healing in all the patients was observed within 10 to 20 days after the operation. Combination of drug and surgical therapy was repeated in 1 patient only, and subsequent clinical healing followed.

In order to appraise the extent of healing attributable to spiramycin and to surgical therapy, respectively, comparison was made between the patients of the first group who received spiramycin and the second group of 8 patients who received other antibiotics combined with surgery. These other antibiotics produced partial regression of inflammation in 6 patients. Decrease in leukocytosis was the only favorable sign observed in the second group. All 8 patients underwent surgical operation, and clinical healing followed after a prolonged postoperative period. Spiramycin has thus proved to be an efficacious therapeutic agent for treatment of chronic osteomyelitis. Another advantageous feature of spiramycin was a perfect tolerance of the patients to the drug, even during prolonged periods of drug treatment.

Nephrotic Syndrome Complicating Mercurial Diuretic Therapy. M. Riddle, F. Gardner, I. Beswick and I. Filshie. Brit. M. J. 1:1274-1277 (May 31) 1958 [London].

The authors report on 4 women and 1 man, between the ages of 61 and 80 years, with congestive heart failure who were treated with mercurial diuretics, such as mersalyl, Unephral (a proprietary combined preparation of mercuramide and theopylline), chlormerodrin, and mercaptomerin, for long periods. The nephrotic syndrome characterized by heavy proteinuria and generalized edema appeared to follow the use of the mercurial diuretics in these patients, 3 of whom died. At autopsy the macroscopic and microscopic findings in the kidneys were the same in all 3 patients. There were necrosis in the renal tubules, and degeneration of the epithelium, together with regenerative activity. Infiltration of tubular cells with isotropic and anisotropic fat was also present. These necrotic and degenerative changes were most often found in the proximal convoluted tubules, but they were also seen in the distal convoluted tubules and in the loops of Henle. Regeneration of tubular epithelium was a striking feature in all 3 patients. The regenerated cells often did not reconstitute the tubular linings, but instead formed loose masses in the lumens. These pathological changes resembled in quality those seen in patients with acute mercuric chloride poisoning. An excessive amount of mercury was found at autopsy in the renal tubules of 2 patients. None of the patients had any previous history of renal disease, and 3 of them had normal urine when treatment with mercurial agents was begun.

These findings strongly suggest that the renal damage in these patients should be attributed to the long-term mercurial diuretic therapy. It seems that the nephrotic syndrome is a more frequent complication of such therapy than the literature would suggest. The principal warning signs of the onset of the nephrotic syndrome complicating mercurial diuretic therapy are: (1) failure of proteinuria to decrease after a satisfactory diuresis; (2) increasing edema, especially of the arms and face, in the absence of other signs of cardiac failure; and (3) absence of diuresis after mercurial therapy. Treatment of the fully developed syndrome proved to be unsatisfactory. Early recognition of the condition and cessation of mercurial therapy before irreparable renal damage has occurred are of the utmost importance if a fatal outcome is to be avoided.

PATHOLOGY

What Cytology Now Offers in the Diagnosis of Bone Tumors. A. Sicard, L. Orcel and C. Marsan. Semaine hôp. Paris 34:1409-1414 (May 18) 1958 (In French) [Paris].

Many difficulties are encountered in differentiating between inflammatory, dystrophic, and tumoral lesions of the bone, and in attempting to decide whether the underlying process is benign or malignant. The functional signs are practically the same in each case, and the roentgenographic picture is made up of shadows which are sometimes so delicate that no definite opinion can be arrived at. The resulting delay in diagnosis, with attempts at empirical or trial therapy, may mean loss of the time during which a cure or stabilization of the lesion might be effected. The possible value of cytological study as a complementary method of diagnosis in patients with bone tumors has therefore been under investigation by the authors since 1954. Biopsy, either by direct surgical approach in bones that are easily accessible or by transcutaneous puncture with a trocar, has long been used, but unfortunately the results obtained by the histological study of bone tissue are not always so certain as those obtained by the histological study of visceral or soft-tissue tumors. Accordingly, the authors decided to compare the results obtained histologically with those obtained cytologically.

Simple aspiration with a needle or a trephine will provide specimens that are satisfactory to the cytologist, but specimens for histological study must be obtained by drilling with a saw-toothed trephine, 4 mm. in internal diameter, mounted on a high-speed motor and revolving within a guide. The use of this instrument does not cause bleeding, and it has never, in the authors' experience, been followed by exacerbation or extension of a malignant process. Complications that might arise when it is used on the vertebral bodies can be avoided by a special location finder devised by the authors, with which the trephine can be accurately placed and prevented from penetrating too far into the bone. Some of the negative results in this series were probably due to the fact that this safety device kept the trephine from reaching an initial lesion lying deep within the vertebral body.

The criteria of malignancy in osseous cytology are generally the same as those described in genital cytology. The position of the malignant cells in the marrow, however, makes it necessary to distinguish between them and the tumoral cells of the hemopoietic system—something that is often difficult to do. No cytological diagnosis could be arrived at in 30% of the first 100 cases in which both histological and cytological methods of examination were used. This figure is far from satisfactory, but it is weighted by early errors and it has been reduced by half (15%) in the diagnostic studies made during the last year. Moreover, the percentage of accurate diagnoses may be expected to increase as improvements are made in technique and as the characteristics of osseous cytology become better known. The routine use of a combination of histological and cytological methods in the diagnosis of osseous tumors seems, therefore, to be fully warranted.

Rectal Biopsy in the Diagnosis of Amebic Colitis. K. Juniper Jr., V. W. Steele and C. L. Chester. South. M. J. 51:545-553 (May) 1958 [Birmingham, Ala.].

Rectal biopsies were done on 14 patients with amebic colitis, in whom rectal ulcers were observed during sigmoidoscopic examination. Trophozoites of Entamoeba histolytica were identified positively on a single routine hematoxylin-eosin-stained section prepared from the tissue block from each of 13 patients. Trophozoites also were found in some of the stepdown sections from the 14th patient. In 2 of the 14 patients the early papular lesions described by several workers were seen at the time of sigmoidoscopy. A biopsy of 1 of these lesions showed an amebic crypt abscess with a small number of trophozoites. The superficial type of ulcer seen in most of the biopsy specimens was in accord with the experimental findings of Faust and Kagy, who found the interglandular areas to be attacked and invaded more often than the crypts in experimental infections in dogs; they described a "fan-like" spread across the necrotic tips of several adjacent glands, which fitted the appearance of many of the biopsy specimens obtained from the 14 patients. The presence of infiltrating plasma cells and lymphocytes about the ulcers, with a noticeable absence of polymorphonuclear leukocytes, corresponded with the description by other workers. The large numbers of eosinophils sometimes seen about amebic lesions in the colon were impressive, and so were the enlarged submucosal lymph follicles usually found beneath the amebic lesions. The latter often extended farther than did the areas of mucosal ulcers.

The results of this study emphasize the importance of the following procedural details: (1) avoidance of washing out the mucus and exudate, in which most of the trophozoites will be found, from the rectum by enemas; (2) taking care to include any available mucus or exudate with the biopsy specimen; (3) instructing the technician in the department of pathology to include all fragments of tissue and exudate with the tissue when preparing the tissue block; and (4) examining clumps of exudate and small fragments of tissue, as well as the large specimen, for the presence of trophozoites. Biopsy of rectal ulcers is not recommended as a substitute for examination of fresh preparations, since the latter almost always will provide the diagnosis when done properly, and since the procedure is simpler. An alert pathologist, however, can recognize and positively identify trophozoites of E. histolytica on routine hematoxylin-eosin-stained slides in a high percentage of cases of amebic ulcers of the rectum, if care is exercised in the collection, preservation, and handling of the biopsy specimen. In a few cases, the pathologist may be the first one to recognize the presence of amebiasis in a hitherto unsuspected or undiagnosed case. Biopsy can also be used as a supplementary means of diagnosis, particularly when staining methods for identification of trophozoites on smears are not available to the clinician in practice.

Serum Cholesterol-Globulin Complex in Multiple Myeloma. G. L. Schless. Am. J. M. Sc. 235:562-565 (May) 1958 [Philadelphia].

The author points out that in 1956 Spain and associates reported a series of patients with multiple myeloma, in whom they noted significantly less atherosclerosis in the aorta and coronary arteries as compared with patients having cancer and with normal individuals. They associated these observations with a low serum cholesterol content. When similar findings were noted in a patient at the Pennsylvania Hospital, in whom a histological diagnosis of multiple myeloma had been made, other reports on this problem were reviewed and studies were made on 12 patients with multiple myeloma, who were collected from 5 Philadelphia hospitals. The serum cholesterol content was decreased in 8 and was normal in 4 of the 12 patients. Nine of the 12 tients exhibited an elevation of the serum globu- level; seven of the 9 patients had decreased serum cholesterol values, while in 2 the values were normal. Two of the 3 patients exhibiting normal serum globulin concentrations had normal serum cholesterol values, and in 1 hypocholesterolemia was found.

Thus, it has been demonstrated that in multiple myeloma hypocholesterolemia is associated with hyperglobulinemia. These findings suggest that an abnormal globulin molecule becomes associated with and binds some of the free serum cholesterol, in this manner reducing the amount of free cholesterol in the serum. Both hyperglobulinemia and hypocholesterolemia are of diagnostic value in multiple myeloma. Further studies are recommended on patients with multiple myeloma in whom hypocholesterolemia is associated with less than average atherosclerosis.

RADIOLOGY

Peptic Esophagitis and Peptic Ulceration of the Esophagus. B. S. Wolf, R. H. Marshak and M. L. Som. Am. J. Roentgenol. 79:741-759 (May) 1958 [Springfield, Ill.].

From the authors' review of the roentgenologic findings in patients with peptic esophagitis and peptic ulcer of the esophagus, it appears that this condition, usually of mild degree, is frequently present in association with a hiatus hernia of the direct variety. The roentgenologic findings in such cases may be minimal. In the presence of a duodenal ulcer or excessive gastric acidity and hypersecretion for some other reason, or as a result of intubation and operative intervention with the aid of general anesthesia, peptic esophagitis of severe degree involving a considerable portion of the distal esophagus may occur and may result in marked stricture formation.

There are patients in whom a variable length of the distal esophagus is lined by an atypical, embryonic, or heterotopic (Barrett) type of epithelium. This type of epithelium is also susceptible to inflammation and the occurrence of ulcers, presumably under the influence of acid gastric juice regurgitated from a hernial sac of (true) stomach. An ulcer in such a gastric-lined segment of esophagus may resemble an ordinary chronic peptic ulcer as seen in the stomach. According to Barrett, previously reported cases of chronic peptic ulcer of the esophagus have been observed in association with this developmental anomaly of the lining epithelium of the distal esophagus which went unrecognized. He therefore suggested that the term "chronic peptic ulcer" of the esophagus should be restricted to this type of lesion. Other authors have used the eponymic term "Barrett ulcer" for the connotation of the same lesion. In the absence of an inflammatory complication, the presence of a gastric-lined segment of the esophagus is not recognizable by roentgen-ray methods and may also be overlooked at esophagoscopy. When a discrete ulcer and/or stenosis is observed by these methods at some distance proximal to a typical hernial sac, the presence of a gastric-lined segment should be suspected. In such instance, the exact location of the ulcer or stricture, i.e., whether it lies within the gastric-lined segment itself or immediately proximal to this segment in normally or squamous-lined esophagus, must be determined by microscopic examination.

In the presence of a direct hiatus hernia, a peptic ulcer of discrete nature may occur in, and be localized to, the terminal portion of the esophagus without remarkable diffuse involvement of the distal esophagus and independent of gastric hyperacidity. When a discrete ulcer is present in the terminal portion of the esophagus in association with a hiatus hernia, the possibility that a Barrett type of epithelium may be present must be kept in mind, since (1) an ulcer may occur at the distal margin of the gastric-lined segment and (2) the terminal portion of the esophagus may be lined by a mixture of squamous and Barrett type of epithelium for a short distance immediately proximal to the (true) stomach.

Arteriomesenteric Occlusion of the Duodenum. W. P. Bitner. Am. J. Roentgenol. 79:807-814 (May) 1958 [Springfield, Ill.].

The author reports on 3 female patients, between the ages of 14 and 31 years, and a 33-year-old man in whom findings on roentgenologic examination of the upper gastrointestinal tract fulfilled the criteria for the diagnosis of occlusion of the duodenum by compression of the superior mesenteric artery where it crosses the transverse portion. These criteria are as follows: 1. There should be a constant dilatation of the duodenum proximal to the midpart of the transverse portion corresponding to the point of contact with the sheath of the superior mesenteric artery. 2. Normal mucosa of the duodenum should be seen distal to the site of obstruction. 3. There should be retention of barium in the duodenum beyond the normal limit. 4. To-and-fro movements of barium should be observed within the duodenal loop proximal to the site of obstruction. Other frequently associated findings include dilatation of the pylorus and stomach, ptosis of the colon and small intestine, ptosis of the right kidney, and passage of barium beyond the site of obstruction, which may be aided by exerting manual pressure on the lower abdomen in a cephalad direction with the patient in a prone position (Hayes maneuver). The 4 patients were operated on by different surgeons, and the roentgenologic diagnosis was confirmed in all. The duodenum was opened, and a finger was inserted into the transverse portion; marked narrowing was found, and the pinchcock action caused by the simultaneous pulsations of the aorta posteriorly and the superior mesenteric artery anteriorly was palpable. A duodenojejunostomy was performed, and the recovery was uneventful.

One of the frequent causes of duodenal stasis is a chronic intermittent occlusion of the duodenal loop due to compression of the third portion of the duodenum by the superior mesenteric artery at the point where it crosses over the loop with the superior mesenteric vein and nerve. It is most frequently seen in the asthenic patient with lordosis. The traction of the mesentery is, therefore, believed to be a factor in the causation. Most of the patients have a variety of digestive complaints, such as epigastric pain, nausea, vomiting, and diarrhea. Neurological symptoms are sometimes prominent, and the condition is very commonly precipitated by severe emotional strain. It is believed that many of these patients will respond to medical treatment directed toward the relief of vomiting and the correction of dehydration, electrolyte imbalance, hyperazotemia, nutritional deficiency, and anemia, and to postural treatment aimed at reducing the pressure of the root of the mesentery on the duodenum. Conservative treatment should be assisted by psychotherapy, since the problem is not simply a mechanical one which can be cured permanently by some short-circuiting operative procedure. If careful medical therapy is unsuccessful, surgery becomes necessary. Duodenojejunostomy is apparently the procedure of choice.

Studies of Esophageal Varices Before and After Portacaval Shunts. J. A. Evans and M. A. Payne. Am. J. Roentgenol. 79:760-767 (May) 1958 [Springfield, Ill.].

The authors report on 68 patients who had roentgenologic examinations for esophageal varices before and after a venous shunt for portal hypertension. Fifty-seven patients had a portacaval shunt, 9 had a splenorenal shunt, and 2 had a shunt utilizing smaller mesenteric veins. The portal pressure was reduced in most patients with portacaval shunts to between 15 to 20 cm. by the shunt, and the final pressure was from 10 to 20 cm. of sodium chloride solution. Postoperative roentgenograms revealed disappearance of the esophageal varices within the first 6 postoperative months in most patients in whom the portal pressure was adequately decompressed. One patient had a portal vein thrombosis, and after the shunt her final portal pressure was 39 cm. of sodium chloride solution. Postoperatively her varices persisted, and 2 years later she again had a large hematemesis. There was only 1 patient whose portal pressure dropped from 41 to 19 cm. after the shunt, who clinically seemed to be well and whose successive esophagrams showed large varices; this was the only patient in the whole series whose esophagrams did not correlate with the observed portal pressure changes. Of the 11 patients with other than portacaval shunts, 6 had hemorrhages after the shunts were performed; 5 of these did not have satisfactory drops in pressure at the time of the operation, and varices remained present on their esophagrams. The 6th patient had a good postoperative pressure drop, but subsequently thrombosis of the shunt occurred and the patient died. Here again, as in the patients with portacaval shunts, the correlation of bleeding with persistent positive esophagrams was striking.

These observations show that roentgenologic examination of the esophagus for varices is an extremely useful diagnostic procedure in following the patient with portal hypertension. In the shunt series it correlates extremely well with the results expected from portal pressure determinations made in the operating room. It also correlates closely with the observed clinical course of the patient and alerts the clinician to the danger of impending hemorrhage.

Renal Papillary Necrosis: Roentgenologic Diagnosis and Formation of Calculi. C. Lagergren and N. Lindvall. Acta radiol. 49:249-268 (April) 1958 (In English) [Stockholm].

The authors report on 52 female and 3 male patients, between the ages of 16 and 65 years, with renal papillary necrosis. Only 6 patients, all of them women, had diabetes mellitus. There was not a single case of obstruction of the urinary tract. Fifty-four of the 55 patients were examined roentgenologically; urography was performed as a rule, and pyelography was performed only in patients in whom the function of the kidney was reduced to such an extent that urograms would not have provided sufficient information. The papillary changes were bilateral in 50 patients and unilateral in 5. The necrosis was purely papillary in 24, medullary in 12, and both papillary and medullary in 18. In 21 (38%) of the 55 patients, secondary formation of calculi occurred. Typical roentgenologic appearances were observed in 52 of the 54 patients.

Only 2 of the 55 patients had an acute fulminating course; all the others had either a subacute or a chronic course. In the patients with subacute or chronic papillary necrosis, renal function may be seriously impaired during the acute attacks, so that urograms are useless. In the quiet intervals between these attacks the kidney recovers its function, though this is gradually reduced as the process continues. It is particularly typical of papillary necrosis that a series of urograms will on one occasion disclose considerably reduced concentration capacity, while on other occasions a normal state may be recorded. This variability is due to the fact that in the acute attacks, arising through acute papillary necrosis, there is a sudden flare-up of the infection accompanied by reduced renal function. When the necrotic portion has become detached, the infection recedes, and there is marked improvement in the function which may even become normal. In contrast to that, there is a progressively slow reduction of renal function associated with common chronic pyelonephritis, and improvement never occurs. When papillary necrosis is suspected on clinical grounds and the first urograms have given negative results, further examinations should be carried out, since a defective papilla is visualized in the roentgenogram when the necrotic portion has become detached, while in the early stages, before detachment has occurred, the roentgenogram may be normal.

Renal papillary necrosis is more common than it was formerly thought. In recent years the disease would seem to have changed its character, becoming more benign. As a rule, the disease occurs in combination with urinary tract infection and mainly in younger persons, particularly in women. Papillary necrosis has no pathogenic relation to diabetes mellitus or urinary tract obstruction. The condition is complicated to a considerable degree by urinary calculi, of which the detached necrotic fragments of the papilla often form the nuclei. This may be revealed by microroentgenologic examination. In most patients with renal papillary necrosis the diagnosis can now be made during life with the aid of urography or pyelography; this is important, since a clinical diagnosis can otherwise be made only with the aid of examination of papillary fragments obtained from the patient's urine or by surgical removal.

Possibilities and Limitations in the Use of Conventional Medical X-Ray Film Under Conditions of Nuclear Warfare. H. F. Nitka. U. S. Armed Forces M. J. 9:648-653 (May) 1958 [Washington, D. C.].

Medical x-ray film is radiation sensitive, but a distinction must be made regarding its sensitivity when stored, as compared with that at the moment it is loaded in a cassette containing 2 fluorescent ("intensifying") screens, which transform x-ray energy into light energy to which the film is much more sensitive. The film-screen combination is approximately 50 times as sensitive to diagnostic x-rays as the film alone. Furthermore, the sensitivity of x-ray film alone (i. e., without intensifying screen) to nuclear gamma radiation is only 1/20th of its sensitivity to diagnostic x-rays. In other words, when stored in the manufacturer's box, the film sensitivity to nuclear gamma radiation is approximately 1/1,000th of its value when actually used (with intensifying screen) by the roentgenologist. This means that medical x-ray film can be stored up to 3 days without significant damage at a radiation level equal to the maximum permissible dosage established to safeguard the health of occupationally exposed adults, which is 0.3 r per week.

There are 3 main sources of significant radiation after an air burst of a nuclear bomb: 1. The initial burst emits high-energy gamma radiation and neutrons. 2. The neutrons of the initial burst induce gamma radiation on the earth to a considerable extent within a 1-to-2-mile radius from ground zero. 3. Radioactive particles are formed in the column and the fireball of the burst and yield the so-called fall-out. Near ground zero of a nuclear explosion, medical x-ray film and equipment are rendered useless. However, general destruction in this area is so complete that no means for medical roentgenography would be available, regardless what roentgenographic system would be used. For distances greater than 1 mile from a nuclear air burst, storage in a basement would provide sufficient protection for medical x-ray film from the initial blast. For surface blasts, protection against fall-out radiation must be considered in addition to shielding against the initial blast. Basement storage of film material will be adequate in most cases. For transport of film through heavily contaminated areas, monitoring of the dosage to which human life is exposed will indicate the time limit up to which film might be usable. As an additional precaution, particularly against scattered gamma radiation from the initial blast, 2 small concrete or brick vaults, to be placed in opposite basement corners, are recommended for film storage. The danger of reducing the diagnostic value of a roentgenogram due to contamination of the developer solution is considered insignificant. Medical roentgenography with conventional x-ray film will be feasible in the neighborhood of a nuclear explosion without extreme measures for protecting the film.

Lipomas of the Colon, With Report of Five Cases. R. P. Henderson, E. J. Harris and J. M. Packer. Am. J. Roentgenol. 79:843-849 (May) 1958 [Springfield, Ill.].

The authors report on 4 women and 1 man, between the ages of 38 and 76 years, with lipoma of the colon who were admitted to the Mississippi Baptist Hospital in Jackson during the last 6 years. All the patients were subjected to a roentgenologic examination of the colon before surgical exploration. The diagnosis of lipoma was suggested in 3 of them. The characteristic appearance of a lipoma, the second most common benign tumor of the colon, was present in 2 of these 3 patients; it was that of an intramural extramucosal tumor with smooth margins, slightly lobulated, and with a broad base. In the third patient, the smooth margins and broad base were also present, but the tumor was not lobulated. In 2 of the patients the tumor appeared to be somewhat compressible on the multiple spot roentgenograms. Lipomas tend to be softer than other tumors when compression is used. Since the radiolucency of a lipoma cannot be recognized on conventional colon examination, again compression spot roentgenograms are of help, because the margins of the growth may not be clearly outlined within the barium-filled colon without compression.

The possibility of a lipoma should be considered in any case of intussusception in an adult. Surgery is the only treatment, and excision is indicated in all patients with a tumor of the colon, regardless of the roentgenologic impression as to the nature of the tumor. Lipomas do not become malignant, but they are symptomatic in more than 80% of the patients. Even a suggestive roentgenologic diagnosis might help limit the resection and make it easier for the surgeon to locate a soft lipoma at the time of operation.

PHYSIOLOGY

Nutrition and Blood Cholesterol Level. E. Picchio and E. Rottini. Minerva med. 49:783-786 (March 3) 1958 (In Italian) [Turin, Italy].

Correlation between nutrition and the serum cholesterol level was studied in 97 inmates of a women's jail. This group was selected because of the standard diet which the inmates had received for a prolonged period of time. The daily diet consisted of 400 Gm. of carbohydrates (which constituted 70% of total calories received), 50.1 Gm. of fat (19.5% of total calories), and 60.8 Gm. of protein (10.5% of total calories); this daily diet amounted to 2,355 calories. Since the inmates worked, the diet was inadequate, being slightly lacking in protein and lipids but rich in carbohydrates; steps have recently been taken to correct the situation. The mean serum cholesterol level in the patients was 223.7 mg. per 100 cc., which is higher than the level which the authors consider normal (208 mg. per 100 cc.).

Fifty-two inmates who had spent more than 5 years in jail had a lower serum cholesterol level (220 mg. per 100 cc.) than 45 inmates who had spent less than 5 years in jail (228 mg. per 100 cc.). This observation is noteworthy when one considers that almost all the inmates who had spent more than 5 years in jail were more than 40 years old and were thus in the age bracket in which an elevated serum cholesterol level is frequent. The authors believe that the serum cholesterol level is closely related to the endogenous rather than the exogenous nutrient metabolism. Poorly balanced diet contributes to the manifestation and to the exacerbation of a preexisting metabolic disorder; it probably does not initiate one.

Effect of Certain Dietary Oils on Bile-Acid Secretion and Serum-Cholesterol. B. Lewis. Lancet 1:1090-1092 (May 24) 1958 [London].

The serum cholesterol level is raised by most fats of animal origin, but it is lowered by many highly unsaturated oils from vegetable and marine animal sources. The object of the present study was to identify the mechanism or mechanisms by which these unsaturated oils lower the serum cholesterol level. Cholesterol is excreted mainly as bile acid both in the rat (taurocholic acid) and in man (glycocholic acid). In the experiments described, 3 patients with complete bile fistulas were studied, the bile acid output being followed during manipulation of the serum cholesterol level by administration of various fats and oils. Sunflower-seed oil (by mouth) and cottonseed oil (intravenously), which are both highly unsaturated, produced a remarkable increase in the rate of cholic acid secretion, which preceded the fall in serum cholesterol level. On the other hand, a saturated fat such as hydrogenated coconut oil, did not affect the bile acid output but raised the serum cholesterol level. These findings support the hypothesis that the mechanism by which the serum cholesterol value is reduced by certain vegetable oils involves accelerated catabolism of cholesterol to cholic acid.

PUBLIC HEALTH

A Twenty-Year Appraisal of BCG Vaccination in the Control of Tuberculosis. J. D. Aronson, C. F. Aronson and H. C. Taylor. A. M. A. Arch. Int. Med. 101:881-893 (May) 1958 [Chicago].

The value of BCG vaccination in the control of tuberculosis among 8 American Indian tribes living in 5 widely separated areas has been investigated over a period of 20 years. Tuberculin-negative school and preschool children, grouped by age and sex, were divided by alternation into 2 groups. A group of 1,551 received an intracutaneous injection of BCG vaccine, while a group of 1,457 received an intracutaneous injection of isotonic sodium chloride solution and served as controls. Twenty years after the study was initiated, in 1956, the areas were revisited, and 1,547, or 99.7%, of the vaccinated and 1,448, or 99.4%, of the controls were accounted for. Of the BCG-vaccinated, 104, or 6.7%, had died during the 20 years: 0.84% of tuberculosis, 3.0% of nontuberculous disease, and 2.9% of violence. Among the controls, 150, or 10.4%, had died of all causes: 4.7%, of tuberculosis, 2.9%, of nontuberculous disease, and 2.9%, of violence. The ratio of deaths from all causes of vaccinated to controls was 1:1.5; the ratio of deaths from tuberculosis was 1:5.2; and the ratio of deaths from nontuberculous disease and violence was 1:1.

Among the vaccinated tuberculosis was responsible for 12.5% of all deaths, while among the controls tuberculosis was responsible for 45.3% of all deaths. In the control group the percentage of deaths from tuberculosis among females was twice as great as that among males, but in the vaccinated group both sexes had the same percentage of deaths from tuberculosis. Under the conditions of this study, a 15-year follow-up would have been sufficient to establish the value of BCG vaccine, since during the last quinquennium only 1 death from tuberculosis occurred among the vaccinated and 3 among the controls.

An Outbreak of Infectious Hepatitis on a College Campus. W. Clark, D. Sachs and H. Williams. Am. J. Trop. Med. 7:268-279 (May) 1958 [Baltimore].

In the fall of 1952, an epidemic of infectious hepatitis was observed among the faculty and student body of a privately operated coeducational college in South Carolina. At least 222 individuals were affected, the over-all attack rate being 8%. The outbreak was abrupt in onset, short in duration, and all its characteristics suggested a common source of infection. Cases were distributed throughout the campus population with great uniformity, with 2 exceptions: disproportionately low attack rates (0.4%) were observed in students who lived off the campus, and disproportionately high attack rates (17 to 50%) were observed in student workers in the common dining hall. Although every evidence pointed to a common source and mode of infection, these could not be determined with certainty.

While nothing could be found pointing directly to water or milk as the source of infection, it is perhaps unwise in the case of infectious hepatitis to use the same criteria for the purity of milk and water supplies as would be applicable for less hardy infectious agents. It is possible that the hepatitis virus could remain a source of infection after treatment adequate to remove other kinds of agents. A recent epidemic in New Delhi, India, presumably caused by virus present in water with acceptable coliform counts, is evidence of this. Possibly the explanation for the outbreak lies in an understanding of its relationship to the epidemic in a smaller school. Use of contaminated fresh produce by the 2 institutions remains an intriguing possibility.

Isolation of ECHO Virus Type 9 from an Outbreak of Aseptic Meningitis with Rubelliform Rash, Toronto, 1956. I. V. Sultanian and A. J. Rhodes. Canad. J. Pub. Health 49:181-185 (May) 1958 [Toronto].

Thirteen antigenically similar strains of a virus were isolated in tissue cultures from 10 patients during an outbreak of aseptic meningitis, associated with the appearance of a rubelliform rash, in Toronto and vicinity in the summer of 1956. Nine of these viral strains were recovered from the feces and 4 from the cerebrospinal fluids of these patients. The agents were readily isolated in human amnion and in the epithelial cells of kidneys of monkeys. Neutralization tests showed that they were antigenically related to the enteric cytopathogenic human orphan (ECHO) virus, type 9. Unlike the prototype ECHO 9, the isolates were pathogenic to suckling mice, and the lesions produced were similar in many respects to those caused by some of the Coxsackie viruses. Serologic studies showed that the isolates were poor antigens. The fact that some of the viruses isolated from patients during the outbreak of aseptic meningitis, with rubelliform rash, were recovered from the spinal fluid, that all strains were antigenically similar, and that neutralizing antibodies developed in the convalescent serums of the patients is further evidence that ECHO 9 strains are human pathogens and give rise to a specific disease.

BOOK REVIEWS

Fundamentals in Cardiology. By John B. Wild, M.D., Assistant Professor, Department of Internal Medicine, Member of Cardiovascular Laboratory, University Hospital, Iowa City, Iowa. Cloth. $4.50. Pp. 83, with 16 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This book by a clinical physiologist describes in graphic form the hemodynamic changes recorded in the various chambers of normal hearts as compared with hearts that are abnormal due to valvular disease or shunts. The data presented resulted from cardiac catheterization studies of valvular and congenital heart disease. The physical findings of each type of heart lesion discussed are pointed out and emphasized in reference to the hemodynamic etiological factors involved. The author wrote the monograph particularly for the student, intern, and resident because of the need for this type of textbook in teaching curriculums. He was aware that the data was scattered throughout the medical literature of the past 10 or 15 years, and by compiling it into a small, compact volume he has performed a welcome service.

Tuberculosis in Animals and Man: A Study in Comparative Pathology. By John Francis, D.Sc., M.R.C.V.S., Professor of Veterinary Preventive Medicine and Dean, Faculty of Veterinary Science, University of Queensland, Brisbane, Australia. Cloth. $18. Pp. 357, with illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; Cassell & Co., Ltd., 35 Red Lion Sq., London, W. C. 1, England; 210 Queen St., Melbourne; 26-30 Clarence St., Sydney, Australia, 1958.

The author's book "Bovine Tuberculosis," published in 1947, provided a basis for one section of this book. The subject of avian tuberculosis, including infection of wild birds and of mammals with avian tubercle bacilli, was aided by the study by Feldman in 1938, and many other original and authentic sources were used. The incidence of tuberculosis in cattle is estimated, and methods of diagnosis, control, and eventual eradication are outlined. The relationship of the three types of tubercle bacilli and of the human and bovine tuberculosis epidemics is discussed. Infection of man with bovine-type bacilli and the so-called skin tuberculosis of cattle, important because it sensitizes to tuberculin, are discussed, with reference to similar conditions in buffaloes and in man. The purpose of the book is to provide a modern account of tuberculosis in all the species for which there is reliable information. Tuberculosis offers an ideal field for the application of the comparative method, and it is hoped the account given will contribute to a better understanding of tuberculosis as a whole and provide a general picture of the disease at a time when a determined effort is being made, in both the medical and veterinary fields, to eradicate this infection. The three sections cover bovine tuberculosis, tuberculosis in animals other than bovine, and a comparison of the pathology and epidemiology of tuberculosis in animals and man. This is a valuable volume to set beside Koch's original paper (1884), Straus's classic "La Tuberculose et son bacille" (1895), Calmette's "L'infection bacillaire et la tuberculose," Cobbetts's "The Causes of Tuberculosis" (1917), and the massive reports of the British Royal Commission on Tuberculosis. As a reference book, it should find an honored place for a long time. The illustrations are well chosen and of high grade. The pleasing arrangement adds to the book's attractiveness.

Care of the Premature Infant. By Evelyn C. Lundeen, R.N., Supervisor, Premature Infant Station, Sarah Morris Hospital of Michael Reese Hospital, Chicago, and Ralph H. Kunstadter, M.D., F.A.C.P., F.A.A.P., Attending Pediatrician and Vice-Chairman, Department of Pediatrics, Michael Reese Hospital. [Portions of book appeared formerly under title The Premature Infant, by Julius H. Hess, M.D., and Evelyn C. Lundeen, R.N., 1941, 1949, Lippincott Company.] Cloth. $8. Pp. 367, with 87 illustrations. J. B. Lippincott Company, 227-231 S. Sixth St., Philadelphia 5; 4865 Western Ave., Montreal 6, Canada; Pitman Medical Publishing Company, Ltd., 45 New Oxford St., London, W. C. 1, England, 1958.

This is an excellent textbook, especially for nurses. It is written by two well-qualified persons and covers the entire problem of prematurity in a simple, clear, and concise manner. The sections on organization of the station for premature infants, nursing routine and techniques, and feeding and feeding techniques are especially commended.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

QUESTIONS AND ANSWERS

ANTIBIOTICS AND PROLONGED STEROID THERAPY

To the Editor:—*What is the general consensus of opinion on the need for antibiotics in conjunction with cortisone therapy in terms of the patient on long-term cortisone therapy, as in arthritis or some of the collagen diseases? The need for close scrutiny to recognize any infection that may develop is realized, but would it be considered necessary to give an antibiotic in conjunction with cortisone to prevent the development of infection?*

Ernest B. Miller, M.D., Manistee, Mich.

Answer.—Antibiotic therapy in prophylaxis should not be given with long-term corticosteroid therapy. Antibiotic therapy should be used in the presence of an active infection after the organism has been isolated and sensitivity studies done.

GRAFTS FOR THIRD DEGREE BURNS

To the Editor:—*In applying split-thickness grafts to a third degree burn, is it better to remove the granulations down to a firm yellow base or to apply the grafts on top of the granulations which are clean (bacteriologically) and healthy? If the granulations are removed, what method should be used so as not to lose too much blood and to prevent oozing of blood beneath the applied split-thickness grafts?* *M.D., New York.*

Answer.—In third degree burns it is best to slice granulations off in sheets, leaving a smooth yellowish base. The granulations must not be scraped. Grafting is more successful on a clean base. Hemostasis should be completely controlled before any graft is applied. Control of capillary oozing is usually effected by means of warm, wet sponges which are applied with pressure. If bleeding persists, the offending vessel may be clamped with a hemostat and crushed. If this is not completely effective, a no. 0000 or 00000 catgut may be used. Sometimes the application of topical thrombin with pressure is also effective. If possible, the use of catgut should be avoided, because during the absorption of this material a localized necrosis takes place at the site of the catgut, although this is usually inconsequential. A massive pressure dressing should be applied after the operation is complete.

BAGASSOSIS

To the Editor:—*Please give information on ba assosis due to sugar cane sensitivity.*

Howard H. Ingling, M.D., Springfield, Ohio.

Answer.—Bagassosis is a pneumoconiosis due the inhalation of bagasse dust, bagasse being t name for the dried pulverized stalks of sugar cane. It is of importance as an industrial hazard in two principal areas: where cane sugar is manufactured and in plants where bagasse is processed into insulating board. The best control measure is prevention, either by adequate forced ventilation or by having exposed workers wear protective filtering masks. Clinically, bagassosis tends to be subacute, with fever and cough the outstanding symptoms. Large, conglomerate radiopaque areas may be seen on chest roentgenograms. After the patient is no longer exposed to the cane dust, symptoms usually clear in one to three months. There is no specific treatment, but patients may be relieved of troublesome symptoms due to hypersensitivity to protein components of the dust by antihistamines or steroids. They should be watched closely for secondary bacterial pulmonary infection in order that appropriate treatment may be begun promptly.

HANDLING TUBERCULOUS SPECIMENS

To the Editor:—*What is the best procedure for a pathologist to follow in handling actively tuberculous autopsy and surgical specimens, with respect to minimizing the hazard of infection to himself and to laboratory technicians and obtaining technically satisfactory slides within two or three weeks after receipt of the specimen? The custom in this laboratory is to fix such specimens in 10% formalin for 10 to 14 days before cutting them. Please evaluate the reliability of this technique.* *M.D., Massachusetts.*

Answer.—To reduce the hazard to the surgeon, pathologist, or laboratory technician who wishes to obtain specimens of tissue from actively tuberculous lesions, the first consideration is the realization that tubercle bacilli are most dangerous when present as minute invisible droplet nuclei in the air inspired by the exposed person. The greatest source of such droplet nuclei is from opening tension cavities. In this consultant's laboratory, an ultraviolet lamp emits monochromatic rays of 2,537 A directly over the autopsy table where the sectioning is done. If possible, it would be desirable to insufflate, under atmospheric pressure, 10%

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

neutral formalin into the bronchus communicating with the cavity and tie off the channel. This not only insures the death of the contained bacilli within a few days but preserves the specimen in its natural anatomic relationship and greatly aids in the assessment of the character and extent of the lesion. At this time the cavity can be sectioned in any desired manner without undue danger of contagion. If it is mandatory to open a fluctuating lesion prior to formalin fixation, one may cover the lesion, umbrella fashion, with filter paper soaked in 70% alcohol or other disinfectant and cut beneath the filter paper so that the escaping spray will be intercepted by the antiseptic-soaked filter paper. When doing this, one should wear gloves and a face mask. Fixation of sections of tissue 2 or 3 mm. in thickness for one week in 10 volumes of 10% neutral formalin is sufficient both for sterilization and for histological preparation. Neutral formalin is the most widely used fixative and is suitable for the greatest variety of subsequent histological procedures.

TRAUMA AND SARCOMA

To the Editor:—*What is the relationship of trauma to the cause or aggravation of an osteosarcoma or Ewing's sarcoma?*

A. F. Barnett, M.D., West Frankfort, Ill.

Answer.—There is no good evidence that trauma of any kind has ever been known to produce an osteosarcoma or Ewing's tumor. A severe bruising injury or a fracture which involved an osteosarcoma has been thought to cause an accelerated rate of growth of the malignant lesion. It would seem reasonable to assume that the same would be true of a Ewing's tumor or any other malignant bone tumor. Aggravation of a preexisting malignant tumor of a bone has been determined by court decisions, and in several instances by the Industrial Commissioners of the State of Illinois, where a patient had suffered a fracture through the tumor area.

FLATTENING OF ONE SIDE OF THE HEAD

To the Editor:—*A baby, 11 months old, always sleeps with his head turned to the right, lying flat with the remainder of the body. The head shows perceptible flattening on the affected side. The anterior fontanelle is closed. What measures should be taken to correct this? If flattening persists, is there any risk of cerebral damage?*

M.D., Connecticut.

Answer.—It is difficult to change the sleeping position of an infant 11 months old, as by that time he can roll over at will. As a preventive measure for such a condition, a very young infant should be made to lie part of the time on each side, back, and abdomen. Infants prefer, as a rule, to face a source of light, and the position of the bed can be changed from time to time so that he is not always facing the light from the same position. Inasmuch as an 11-month-old infant sits or stands much of the time while awake, unless a torticollis exists while sitting no permanent damage can result. The infant should be placed on his abdomen before falling asleep or, if he will not fall asleep in that position, turned on his abdomen as soon as sound asleep. The flattening of his head on the affected side will not cause any cerebral damage and will largely disappear over the next few years. However, if a torticollis (holding the head to one side) does exist when he sits or stands, orthopedic care is indicated (possibly a shortened sternocleidomastoid muscle may be the cause).

SALMONELLA CARRIER

To the Editor:—*A 39-year-old woman was treated for enteritis caused by a salmonella infection in January, 1958. She was given 250 mg. of chloramphenicol four times a day for one week. Because of a persistent positive stool report of Salmonella paratyphi B var. java from the state public health laboratory, she was again given chloramphenicol, this time for two weeks. Her stool cultures have remained positive. Findings on complete x-ray and sigmoidoscopic examinations were essentially negative. She had an appendectomy in 1946. She is asymptomatic. What is suggested for treatment?*

Harry W. Depew, M.D., San Diego, Calif.

Answer.—The failure of the patient to respond to treatment with chloramphenicol is evidence that the organism is either resistant to the antibiotic in the dosage given or may be in her gallbladder or bile ducts and hence inaccessible to the drug. Since there is no assurance that treatment with other antibiotics would cure the carrier condition and since the patient is not a food handler, this consultant would recommend no further treatment. In many cases the carrier condition clears in a matter of months, and for that reason stool cultures should be taken at six-month intervals to see whether the carrier state persists.

BIOLOGICAL ACTIVITY OF BANK BLOOD

To the Editor:—*What is the proportion between biologically active oxyhemoglobin and the hemoglobin in bank blood with A.C.D. solution added as an anticoagulant, according to spectroscopic examination, as supplied by blood banks?*

Alfred R. Ross, M.D., Cape Vincent, N. Y.

Answer.—Bank blood (with A. C. D. solution, anticoagulant) 1 day old is indistinguishable from 21-day-old bank blood as judged by spectroscopic examination, both being within the range of normal. In vivo survival studies provide a measure of biological activity of the erythrocytes and their hemoglobin. Such studies show that virtually 100% of erythrocytes survive normally in the recipient if the bank blood is preserved with A. C. D. solution and is infused no later than 10 days after donor venesection. In contrast, bank blood administered 21 days after donor venesection shows normal survival of over 70% of the infused erythrocytes, the rest (together with their hemoglobin) being removed from the recipient's circulation within 24 hours of infusion.

BITTERNESS IN THE MOUTH

To the Editor:—*A man, aged 57, complains of a strong taste of bitterness in his mouth and throat all the time regardless of what he may eat or drink or the kind of work he may do. This sensation began after his tonsils were removed Feb. 7, 1958. Findings on all examinations have been essentially negative. The only thing found was a fairly large hiatus hernia. Is it possible that there could be a regurgitation of digestive fluids or bile which would cause the taste of bitterness in the mouth? What else might cause this disagreeable sensation?*

Frank R. Ruff, M.D., Fresno, Calif.

Answer.—The complaint of "bitterness in the mouth and throat" is not an uncommon one. There are probably a good many causes, but in most instances the complaint is of a functional nature, related to aerophagy, dietary habits, poor elimination, and dental care; at times there is an associated compulsive neurosis. The possibility of regurgitant esophagitis associated with an esophageal hiatus hernia could receive consideration. Esophagoscopy and roentgenologic examination should help to determine this. It is unlikely that repair of such a hernia will eliminate this symptom. Rarely is the actual cause of this unpleasant symptom found.

EMOTIONAL PROBLEMS FOLLOWING ORGANIC BRAIN DISEASE

To the Editor:—*A 42-year-old man had a cerebral hemorrhage a year ago, causing a hemiplegia. He is sufficiently recovered to resume a responsible job, but he has sought psychiatric help because he is prone to outbursts of rage toward his family and is fearful of being destructive. Are emotional problems following organic brain disease amenable to psychotherapeutic help?*

M.D., Indiana.

Answer.—A person suffering from the after-effects of organic brain disease can be helped by psychotherapy insofar as he is a reasonable individual. It may be concluded that he can be reasoned with, since he has been able "to resume a responsible job." Having suffered a cerebral hemorrhage which left him with a hemiplegia, there is obvious destruction of brain tissue, and, therefore, he may be said to have suffered a "lobotomy." Where lobotomies are done for therapeutic reasons, it is not uncommon to find the patients lacking control of emotional outbursts after such operations. In any case, where there is a lack of emotional control, there is potential danger of destructiveness. Psychotherapy would, therefore, have to be directed toward giving the patient an understanding of his margin of safety and leading him to the realization that he has to keep within that margin. Otherwise, he may get out of emotional control. A review of recent literature does not reveal any specific reference to the use of psychotherapy in organic brain disease, but the same principles that are used in the treatment of any mental illness certainly apply in this case. Consequently, any standard textbook on psychotherapy would give the essential techniques.

GYNECOMASTIA AND RESERPINE

To the Editor:—*A 75-year-old man with hypertensive vascular disease gives a history of having had a malignant tumor of the testis removed with supplemental x-ray therapy in about 1932. There is no sign of recurrence. Twice, when his dosage of reserpine was increased to a maximum of 3 mg. per day, he developed a definite enlargement and tenderness of the right breast with edema of the areola and darkening of the nipple. There has been a slight reaction on the left nipple with no breast enlargement. On withdrawal of this therapy, the gynecomastia subsided completely. Please give an explanation of this occurrence.*

David Gregory, M.D., Glasgow, Mont.

Answer.—There is no reason to suppose that the mammary response to high doses of reserpine was in any way related to the occurrence of a testicular tumor a quarter-century before. Stimulation of the mammary gland, however, may occur rarely in either sex as a side-effect of high doses of the tranquilizing rauwolfia or phenothiazine products. Continued administration probably would have led to milk secretion. Animal experiments indicate that this phenomenon is due to the release of pituitary lactogenic hormone (prolactin) associated with inhibition of gonadotropic hormones. A sensitivity of this type is no contraindication to the use in such a case of what would probably be the safest antihypertensive therapy, namely, a combination of smaller doses of reserpine with other drugs, such as hydralazine hydrochloride, ganglionic blocking agents, or chlorothiazide. Properly individualized combination therapy may permit the use of smaller doses of all drugs concerned, in which their separate side-effects would be minimized or absent.

PERSISTENT "BLINKING" IN A CHILD

To THE EDITOR:—*An 8-year-old girl, in good health, began to "blink" her eyes about one year ago. An ophthalmologist found nothing wrong with her eyes, but the patient says they feel irritated. She is allergic to some foods. Could this be due to a nutritional deficiency? Her diet seems to be well balanced. What are the causes of such a condition? Please give suggestions for therapy.*

Jerome Kogan, M.D., Stamford, N. Y.

ANSWER.—"Blinking" in a child may be caused by several things: 1. Recurrent irritants. This is most unlikely except in such instances as constant exposure to chlorine or other chemicals in a swimming pool. 2. Low-grade, persisting infection of the cornea or conjunctiva. This, in the experience of this consultant, is not common but is possible and might well be established by the use of appropriate laboratory procedures. 3. Allergic conjunctivitis. This condition is not common either, but it is a decided possibility, and clinical appearance and appropriate laboratory procedures would help to establish this diagnosis also. 4. Disease of the central nervous system. This, too, is an uncommon cause. 5. "Nervous habit." Such is the most common cause of blinking in children and is frequently seen in children who pull their hair, fiddle with their nose and ears, chew their fingernails, and suck their thumbs. If organic cause has reasonably been ruled out, an effort should be made to ignore the blinking completely and, if necessary, to seek psychiatric or psychological advice. It is doubtful that nutritional deficiency would play any part in this condition. It is not common to find that local irritation, in the form of either low-grade infection or allergy, will start the blinking, and this may continue as a nervous habit. The use of soothing washes containing soda and soothing drops containing a slight amount of anesthetic and antiseptic and, probably, the oral administration of one of the antihistamines would seem to be helpful in cases which continue to be nonspecific in nature. It must be recalled that, unless the blinking is severe, any treatment may tend to prolong a so-called nervous habit.

GENETIC BACKGROUND FOR LEUKEMIA AND DIABETES

To THE EDITOR:—*A baby is up for adoption. The grandfather of this baby is a diabetic; a first cousin died of leukemia. The would-be adoptive parents want to know what effect this history has on the future of the baby.*

W. A. Rauch, M.D., Manitowoc, Wis.

ANSWER.—There is no evidence as yet to indicate a strong genetic background for leukemia, and, as it is only the first cousin of the baby who was affected, this factor can be ignored in planning for adoptive placement. The likelihood of the baby becoming diabetic is considerably higher because of the high frequency of diabetes in the whole population. The frequency of diabetes in the population eventually turns out to be as high as 3 or 4%, but it is, of course, a great deal lower than this in children. The evidence seems to be that diabetes is a recessive trait which is carried by perhaps as much as one-fifth of the population. Consequently, this baby and all other babies have a reasonable chance of developing diabetes at some time. However, with proper therapy it does not cut down their life expectancy and, indeed, is not a very serious problem in most cases. This consultant's recommendation would be for the adoptive parents to go ahead and adopt the baby and to pay no further attention to the problems of leukemia and diabetes beyond what any well-educated couple would do in having occasional physical check-ups for their children, which, of course, include a urine sample.

THINNING OF HAIR IN WOMEN

To THE EDITOR:—*A 37-year-old woman was seen because of weight loss and alopecia, present for five or six months. She also has a mild anxiety neurosis. Her history is noncontributory, and findings on physical examination were completely within normal limits except for generalized thinning of scalp hair, several areas being almost completely bald with no new hair growth noted. Please give suggestions or information on treatment for this condition.* *M.D., Kentucky.*

ANSWER.—Thinning of the hair in a woman approaching 40 years of age and loss of weight are nonspecific findings and are not indicative of any diagnosis. Many conditions may cause thinning of the scalp hair in an adult. However, it is assumed that the patient has no seborrheic dermatitis, trichotillomania, or alopecia areata, any recent illness or pregnancy, or exposure to an overdose of x-rays. Dermatologists are encountering more and more of this type of alopecia. It is tempting to theorize that the loss of hair is on a hormonal basis, such as a masculinizing tumor or premature menopause with a disturbance of the androgen-estrogen balance to the male side. However, many of these cases are due to less exotic causes, such as the use of cold waves or hair straighteners. If this is the situation, the hair will break off rather than fall out. The patient often will interpret this as a baldness due to shedding of the hair rather than to its rupture. Discontinuance of such chemicals results in a "cure" in one to three months. Excessive brushing is to be deplored. If these suggestions are not applicable to this patient, she should be subjected to an expert endocrinological analysis and a search should be made for a masculinizing tumor, such as an arrhenoblastoma of the ovary. Treatment with estrogenic substances may be indicated by such a survey.

DISSOLVING CORNEAL OPACITIES

To the Editor:—*Has a new drug been made available for the treatment of amblyopia in a diabetic patient? A 79-year-old woman has had diabetes for 35 years. Eye tests revealed no cataract or other condition and the presence of acid and sweet tears. The blood sugar level was 150 mg. per 100 cc.; the urine was free of sugar. Her maintenance therapy has included insulin, 10 units of the 80 units per cubic centimeter concentration, and lente insulin, 30 units of the 80 units per cubic centimeter concentration. A scum has formed over the eyes, producing blurred vision. Attention has been drawn to a medicine, given in drop form, that will dissolve this coating on the eyes. Please give information on such a drug.*

Roy Millsap, M.D., Los Angeles.

Answer.—Amblyopia as a complication of diabetes can be due to numerous conditions. In a 79-year-old person who has had diabetes for 35 years, it would be unusual not to find diabetic retinopathy. The "scum" over the eyes refers, apparently, to corneal opacities. The only corneal opacity that can be dissolved is that due to calcium infiltration, as in band-shaped retinopathy, which gives a pathognomonic picture on biomicroscopic examination with the slit-lamp. For treatment, a chelating agent is used, edathamil calcium-disodium (calcium disodium ethylenediaminetetraacetate, EDTAA), 0.37%, with a 0.1% solution of sodium bicarbonate, which is sterilized by boiling. After the corneal epithelium is peeled off, the solution is dropped into the eye continuously for 15 minutes. The prepared solution is obtainable in quantities of 100 cc.

MERCURY AND ACRODYNIA

To the Editor:—*Has a relationship between acrodynia and mercury absorption been established? For some reason diaper rashes in a patient are much more frequent and persistent lately. These rashes formerly responded to treatment of the diapers with bichloride of mercury. Another helpful ointment was ammoniated mercury. Is it wise o give up the use of these mercurials, at least in children up to 3 years of age?*

Blackwell Sawyer, M.D., Toms River, N. J.

Answer.—At present the exact cause of all cases of acrodynia is not established, but mercury, and at times other heavy metals, as the cause is the best substantiated and documented. If these heavy metals are the etiological agent, then there must be an unusual tissue sensitivity or idiosyncrasy to the chemical compounds. The finding of mercury in the urine, the frequency of a history of ingestion of some mercury compound, and the response to dimercaprol weigh heavily in favor of mercury as being the etiological agent. Warkany and Hubbard (*A. M. A. Am. J. Dis. Child.* 81:335, 1951) found mercury in the urine of 25 of 28 children with the disease, and in the 3 with negative findings there was a history of taking mild mercurous chloride. Franconi and others (*Helvet. paediat. acta* 3:264, 1948) reported positive urinary findings in 19 of 20 cases and Holzel and James (*Lancet* 1:441, 1952) in 61 of 94 cases. Bichloride of mercury and boric acid are used much less frequently than formerly to prepare diapers because of the hypersensitivity and toxicity reported from their use. There are several commercial compounds on the market that are effective and less toxic than bichloride of mercury.

EXCESSIVE SALIVATION IN PARKINSONISM

To the Editor:—*Is there anything which can be used to check the excessive salivation which occurs in patients with Parkinsonism?*

M.D., Iowa.

Answer.—There is nothing effective for the eccessive salivation which occurs with this condition. The various drugs used in the treatment of other symptoms have a drying effect on the mucous membranes in varying degree, but they are ineffective in stopping excessive salivation.

SERUM CHOLINESTERASE AND MYASTHENIA GRAVIS

To the Editor:—*In* The Journal *for June 21, 1958, page 1057, a question was concerned with cholinesterase levels in a patient with myasthenia gravis and a history of frequent exposure to various and sundry insecticides. The consultant indicated that he had no evidence that chronic residuals from insecticides affect the level of serum cholinesterase. I would therefore like to direct attention to the report by Quinby and Lemmon (J. A. M. A. 166:740-746 [Feb. 15] 1958). In some of the cases of poisoning due to parathion residues reported by these workers, laboratory determinations indicated decreased cholinesterase activities in plasma, as well as in erythrocytes. These findings imply that blood cholinesterase levels are affected by residuals from certain insecticides.*

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The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*The article by Quinby and Lemmon applies to residual insecticides left on the crop, not to residual symptoms that accompany low cholinesterase levels in the serum. In their report the values returned to normal ranges in three to six weeks after exposure. As far as is known, this kind of chronic poisoning is not related to myasthenia gravis as was stated in the question.*

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Civilian Medicare Program May Be Closed Down Next Year . .
New Amendments Explained by Social Security Administration . .
U. S. Will Allow Patents on Cancer Research Developments . .
Veterinary Corps Preserved by Defense Secretary McElroy . .

JAN. 1 CUTOFF IN CIVILIAN MEDICARE PROGRAM A POSSIBILITY

With the Oct. 1 date for drastic curtailment of Medicare approaching, the program's retiring director, Major Gen. Paul I. Robinson, warns that a complete shutdown of the civilian phase on Jan. 1 is a possibility, unless Congress appropriates more money.

The problem lies in a directive from Congress to the Defense Department not to spend more than $70,200,000 on the civilian part of Medicare and to effect the saving by treating more service families in military facilities. But even by channeling all dependents possible to military facilities, Medicare planners expect that the $70,200,000 will be virtually exhausted or committed by the first of the year.

Last fiscal year, Medicare actually cost over 100 million dollars, or about 30 million more than was appropriated. The deficit was made up by shifting other military funds to Medicare. Now, Medicare directors question whether they should use this device this year, in view of the instructions from Congress to stay within the $70,200,000. These instructions were not in the form of a law but were contained in the conference report that accompanied the appropriations bill.

There are two possible courses of action. Medicare could use other funds to supplement the appropriation, as in the past, and then go before Congress next year and explain why the instructions could not be followed. Or the civilian phase of the program could be stopped when the $70,200,000 is spent or committed. The Defense Department now is trying to decide whether it must allow for the "carryover" in the present appropriation or plan to pay it out of next year's funds. The carryover from last fiscal year ending on June 30 was about 18 million dollars, representing hospital and doctor bills accumulated in the latter part of the year and too late for payment before June 30.

General Robinson, who had headed Medicare since its establishment on Dec. 7, 1956, retired on Sept. 1 to join the medical staff of the Metropolitan Life Ins. Co. in New York.

In a further elaboration of curtailed services for Medicare patients, starting Oct. 1, the Army's Office of Dependent Medical Care said elective surgery is no longer authorized; then it gave the following definition of such surgery:

"Medicare or surgical care that is desired or requested by the patient which in the opinion of the cognizant medical authority can be subsequently scheduled and effectively treated at a later date without detriment to the patient, e. g., diagnostic surveys, cosmetic surgery, reconstructive surgery, tonsillectomies, uncomplicated hernias, and interval appendectomies."

The following procedures will still be permitted under Medicare, the ODMC said:

1. Bona fide surgical emergencies which cannot be handled on an outpatient basis. Patients must be acutely ill and in need of immediate hospitalization and treatment. Examples: perforated duodenal ulcer, hemorrhage with shock, intestinal obstruction, and similar recognized emergencies.
2. Acute surgical conditions in which the patient is in clinical need of hospitalization without delay with a view to surgical correction of the basic condition. Examples: acute appendicitis, empyema of the gall bladder, twisted ovarian cyst, strangulated hernia, pelvis abcess.
3. Injuries of such severity as to require hospitalization, but only for the treatment of the acute phase; no readmission for sequelae of injury except an acute medical or surgical requirement such as osteomyelitis with acute exacerbation.

The ODMC added that the following elective surgery procedures that will not be permitted: dilation and curettage, routine hysterectomy, ligation of the Fallopian tubes, heart surgery, submucus resection, and rhinoplasty.

SOCIAL SECURITY ADMINISTRATION EXPLAINS NEW AMENDMENTS

As the recently-passed social security amendments became law upon signature by President Eisenhower, the social security administration explained the changes that will apply to the 12,000,000 persons now receiving retirement, disability, and survivors benefits and the 74,000,000 making payments toward their future benefits. Some of the points are the following:

Minimum monthly pay for an individual now retired will be $33 and maximum will be $116, compared with present rates of $30 and $108.50; the maximum for a retired worker and his wife goes from $162.80 to $174.00.

Dependents' and survivors' benefits increase about 7%, except that the figures will be less when several members of a family are receiving checks; the maximum family benefit is boosted from $200 to $254. The above increases will be automatic and need not be applied for.

To finance the more liberal benefits, payroll taxes on both employer and employee move from 2.25 to 2.5% and for the self-employed from 3.375 to 3
Both benefits and new taxes go into effec
uary, which means that the self-em

be paying the higher rates on 1958 earnings. Furthermore, the amendments will tax the first $4,800 of income instead of the first $4,200 as at present. As a result of the boost in taxable income, those retiring in the future may look forward to a maximum monthly payment of $127 for a single individual and $190.50 for a worker and his wife.

The new law makes dependents of disabled workers eligible for the same benefits they would receive if the worker were retired at age 65. These payments can go to any children under age 18, or over 18 if they were disabled prior to their 18th birthday. The wife also is eligible if she has in her care any children eligible for benefits; if she does not thus qualify, she will have to wait for age 62 to receive payment.

Unlike the other social security increases, the disability benefits will not be paid automatically but must be applied for. More than 200,000 disabled workers between 50 and 65 years of age now are receiving benefits; it is estimated that about 180,000 dependents of disabled workers will benefit from the new arrangements. Payments were effective on Sept. 1.

Disabled person will benefit in another respect. Until now, social security benefits were reduced by the amount received as workmen's compensation or other such payments from the federal government; now full social security benefits are paid, regardless of any other benefits received.

The law also makes it easier for a disabled person qualify for payments under the "wage freeze." p to now, he has had to have five years of covered nployment out of the 10 years before becoming disabled and one and one-half years out of the past three. Under the new law, the latter requirement is eliminated. Disabled workers who were prevented from obtaining benefits in the past because of this requirement are reminded they now will have to file new claims.

INDUSTRY ALLOWED PATENTS ON CANCER CONTRACT RESEARCH DEVELOPMENTS

Industry doing cancer research under federal contracts will now be able to patent and sell drugs or other chemical agents that flow from government-sponsored research. This new policy position was announced by the Department of Health, Education, and Welfare.

Dr. John D. Porterfield, acting surgeon general of the Public Health Service, commented: "When industry accepts a government research contract and devotes its scientific knowledge, facilities, and personnel to this field, it quite properly expects a reasonable opportunity to protect its investment and rights to produce and use a chemical or other agent derived from its own research efforts. On the oth nd, if the government finances all or part of trial research, government has a respon- sure that the products of that research and promptly available in a manner ublic interest.

ement is an important step for- program of cooperative re- therapy and is expected to uctive cooperation among tions and the federal

VETERINARY CORPS CONTINUED
BY McELROY

The veterinary services of the armed forces have been saved. Defense Sec. Neil McElroy has quietly reversed a decision of former Sec. Charles Wilson which would have done away with the veterinary corps and shifted its duties to other agencies as well as to the military medical services.

The American Medical Association joined with the American Veterinary Medical Association in urging the new secretary to set aside the changes proposed by Mr. Wilson.

Defense officials now feel that the advent of the space age has increased the responsibility of the veterinary corps, for example, use of animals in space medicine. Also, there is increased activity in such fields as bacteriological and radiological medicine, in which the veterinarian play a part.

Appointments in the regular Army and Air Force Veterinary Corps, held up pending the outcome of the issue, are now expected to move ahead.

ARMY REDUCES SIZE AND FREQUENCY OF IMMUNIZATION SHOTS

Because fewer vaccinations are required with the vaccines now in use, the Army has reduced the size and frequency of shots, on recommendation of the commission on immunization of the armed forces epidemiological board. Here are some of the changes.

Present typhoid-paratyphoid immunization practice calls for a booster shot every three years. This has been reduced to two booster shots at four-year intervals for those remaining in continental United States, Canada, Alaska, and Hawaii; further shots are required if travel is to some other world area.

Booster shots will not be given for cholera-typhus, even when the individual is residing in a cholera-typhus section, unless there is "an actual risk of infection."

Separate immunization will not be required for diphtheria, as this is in included in a new tetanus-diphtheria vaccine; this change has been in progress for some time.

Although the new policy generally reduces the number of shots, it also includes the requirement that vaccination for poliomyelitis for the first time will be mandatory for all personnel under age 40 prior to travel outside the continental United States.

International quarantine requirements still will be observed, but the surgeon general of the army may waive military immunization requirements for persons traveling overseas on short trips under auspices of the armed forces.

MISCELLANY

Walter Reed Army Institute of Research has demonstrated for the first time the whole body counting facility. Described as one of the most important innovations in the field of nuclear medicine, the facility can measure directly the natural and acquired radioactivity in man. The original such unit is at the Atomic Energy Commission's Los

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DIAGNOSIS AND CLINICAL MANAGEMENT OF FUNCTIONING CARCINOIDS

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and
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Functioning carcinoid is a serotonin-secreting argentaffin tumor which may metastasize. The excess serotonin produces special symptoms, such as characteristic spells of flushing of the skin, and is associated with the appearance of abnormal amounts of 5-hydroxy-3-indole acetic acid in the urine. In addition, the functioning carcinoid may induce cramps, diarrhea, and other less typical symptoms generally associated with intra-abdominal tumors. Histories of 12 patients with this disease are given in detail. The primary lesion was located in the small intestine in seven patients. The diagnosis is confirmed by the finding of abnormal quantities of 5-hydroxy-3-indole acetic acid in the urine. The best current treatment is surgical removal of as much of the tumor as possible.

TRACING the development of the syndrome known today in the United States as functioning carcinoid and abroad as metastasizing argentaffin carcinoma is like watching the pieces of a giant jigsaw puzzle fall together. After the description of carcinoids as a pathological entity, it was originally thought that these were benign lesions. However, around the turn of the century it became apparent that they may metastasize and produce masses in the abdomen. Not until five years ago was it realized that they function as endocrine tumors in the sense that they secrete serotonin, which exerts its effects on the vessels of the skin, the smooth muscle of the gastrointestinal tract and bronchi, and the valves of the heart and is found also in the brain, where its function is under study. We ordinarily think of an endocrine tumor as acting through its hormones, in the classic fashion, but resulting in overstimulation of a normal physiological process; for example, the production of hypoglycemia by an islet cell adenoma of the pancreas. However, in the syn-

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Read before the Section on Gastroenterology and Proctology at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

drome of functioning carcinoid there is no known normal parallel, and the clinical picture produced is entirely pathological.

The primary carcinoid lesion is usually very small, may often be multicentric, and frequently is situated in the distal part of the ileum, but metastatic lesions may occur after many years, grow slowly, and assume massive proportions. Metastasis usually occurs to the lymph nodes and liver, and occasionally to the lungs, bones, and ovaries. It is generally agreed that carcinoids, especially those arising in the stomach, small intestine, and colon, are malignant and may metastasize. Pathologists[1] estimate that carcinoids arising in the appendix constitute from 58 to 90% of all carcinoids. Extra-appendiceal lesions may arise in the stomach, duodenum, jejunum, ileum, cecum, colon, rectum, gallbladder, gastrointestinal components of a teratoma, and, as recently observed, in the lungs. It is stated that appendiceal carcinoids are of an unusually low grade of invasiveness, and in a review of the English language literature and in his series of 207 appendiceal carcinoids MacDonald[1b] could find no adequately documented instance of metastasis beyond regional lymph nodes.

After acceptance of the concept that carcinoids are malignant and may metastasize, little new information was added until a peculiar syndrome, that of functioning carcinoid, was described by Biörck and co-workers[2] in 1952 and by Thorson and co-workers[3] in 1954. They gave criteria for diagnosis and expressed the view that metastasis to the liver is an important factor in the genesis of this syndrome and that the common denominator in the production of its signs and symptoms is 5-hydroxytryptamine, or serotonin.

Investigations on Carcinoids and Serotonin

Many investigators have studied the pharmacological aspects of this substance and its relationship to this syndrome. Erspamer,[4] in the mid 1930's and early 1940's, conducted investigations leading to the identification of enteramine, a substance imparting peculiar histochemical properties to the enterochromaffin cells of the gastrointestinal mucosa. Rapport and co-workers,[5] in 1948, isolated from beef serum a crystalline vasoconstrictor substance which they called serotonin. The next year Rapport[6] proposed the constitutional formula of 5-hydroxytryptamine for this substance. Hamlin and Fischer[7] confirmed this structure by synthesis of serotonin in 1951. A year later Erspamer and Asero[8] identified enteramine as 5-hydroxytryptamine and also synthesized it. In 1953, Lembeck[9] extracted 5-hydroxytryptamine from a carcinoid found at autopsy and thus corroborated Erspamer and Asero's assumption of the origin of the substance.

Page and McCubbin,[10] Comroe and associates,[11] Gaddum,[12] and others have studied relationships between the clinical syndrome of functioning carcinoid and the pharmacological action of 5-hydroxytryptamine. In 1955, Erspamer[13] discussed the degradation of 5-hydroxytryptamine to 5-hydroxy-3-indole acetic acid, Page and associates[14] and Sjoerdsma and Udenfriend[15] demonstrated an increase of the latter substance in the urine of patients with carcinoids, and Sjoerdsma and associates[16] described a simple test for the diagnosis of metastatic carcinoid. Udenfriend and associates[17] presented a method for quantitative assay of 5-hydroxy-3-indole acetic acid in normal urine soon thereafter. At about this time, Pernow and Waldenström[18] and Page and associates[14] expressed their reasons for considering argentaffin carcinoma or functioning carcinoid as an endocrine tumor. They expressed the view that the whole syndrome results from increased production of a pharmacologically active substance by the malignant cells and stated that the presence of large amounts of 5-hydroxy-3-indole acetic acid in the urine may be regarded as the best indication of the presence of functioning carcinoid.

Further understanding of the syndrome was advanced by the reports of Sjoerdsma and associates[19] when, using tryptophan labeled with radioactive carbon (C^{14}), they were able to demonstrate the pathway for the production of 5-hydroxytryptamine and its ultimate breakdown to 5-hydroxy-3-indole acetic acid. MacDonald,[1b] in 1956, studied data on 356 carcinoids of the gastrointestinal tract gathered from the records of the Boston hospitals and added four new cases of the syndrome of functioning carcinoid. He said that the addition of his new cases brought the total number of acceptable cases of this syndrome reported to that time to 57. In this report he documented the pathological findings in regard to the valvular lesions of the right side of the heart. He also noted a rather high incidence of gastric and duodenal ulcer in association with carcinoids. He suggested, too, that some relationship might exist between these tumors and arthritic changes usually involving the joints of the fingers. Several other cases of this syndrome have been reported since MacDonald's review, including four cases that we presented[20] in May, 1957, at the meeting of the American Gastroenterological Association.

In the past year and a half principal interest has centered about the relationship of serotonin and its precursor, 5-hydroxytryptophan, to the production and excretion of histamine in patients with this syndrome. Large amounts of histamine have been demonstrated in the urine obtained from these patients, and blood studies[21] have shown high levels of 5-hydroxytryptophan. It was also demonstrated[22] that the tumor pool of serotonin could be calculated by using radioactive labeled 5-hydroxytryptophan. Recently it has been postulated that a tumor exists which secretes 5-hydroxytryptophan, produces an atypical picture of functioning carcinoid,[23] and is characterized by the excretion of large amounts of histamine as well as large amounts of 5-hydroxytryptophan and serotonin in the urine, but has only small amounts of serotonin present in the tumor.

A very extensive review of the physiological properties of serotonin as described during the last four years has been presented recently by Page.[24] The popularity of this subject currently is attested to by the fact that Page listed 529 references in this review article. The reader is referred to this excellent article for a comprehensive survey of this interesting substance and the many interesting and important studies in relation to this substance and functioning carcinoid.

Report of Cases

Case 1.—A 72-year-old woman was admitted to the Mayo Clinic in March, 1957, with the complaint of loss of weight during the last seven months. For 50 years she had had right subcostal aching, bloating, and gaseous distention with occasional pain extending through to the back. For four years she had tired easily. For three years she had had a stinging sensation on the right side of the tongue. For two years episodes of flushing of the face had occurred on the average of once or twice a week. The flush began at the back of the neck, spread over the neck and face, and involved the upper anterior part of the thorax. The flush appeared to be irregular or spotty on the neck, but was diffuse over the face. She felt hot during the flush, and her husband stated that she "looked as red as fire." The flush lasted for a few minutes and seemed to be precipitated by eating, usually occurring 10 minutes after meals. She denied diarrhea, asthma, or cardiac symptoms. For nine months she had been aware of recurrent, severe cramping epigastric pain which was worse after meals and occasionally awakened her at night. Relief was obtained by vomiting or belching. In the three months prior to admission she had fainted three times. She had reduced her intake of food because of pain and had lost 23 lb. (10.4 kg.).

The patient weighed 97 lb. (44 kg.). The blood pressure, pulse, and temperature were normal. There were no cardiac murmurs and no palpable abdominal masses or organs. Studies of the blood and urine disclosed only mild hypochromic anemia. Urinalysis was positive for 5-hydroxy-3-indole acetic acid. X-ray examination of the thorax, gallbladder, and stomach did not reveal any abnormality. Proctoscopic examination gave negative results. On March 25, 1957, abdominal exploration disclosed in the upper part of the ileum a carcinoid 1.2 cm. in diameter. There was extension to the root of the mesentery with involvement and obstruction of the superior mesenteric vein by a mass measuring 5 to 6 cm. Biopsy proved the diagnosis of carcinoid. Four or five metastatic nodules were found in the right lobe of the liver. Enteroenterostomy was done to relieve obstruction. The postoperative course was satisfactory. The administration of tryptophan seemed to increase the urinary excretion of 5-hydroxy-3-indole acetic acid (table 1).

Case 2.—A 68-year-old woman came to the clinic on July 26, 1957, because of multiple enterocutaneous and colocutaneous fistulas. She gave a history of gaseous discomfort in the lower part of the abdomen, especially after eating a large meal in the evening. From 1950 to 1954 she had had four episodes of intermittent, incomplete obstruction of the small intestine. In 1954 she experienced episodes characterized by a red, blotchy flush involving the upper part of the trunk, the face, and the arms and associated with extreme sweating of the neck and face. The episodes lasted five minutes, seemed to be precipitated by alcoholic beverages, emotional upsets, and occasionally by eating and had gradually progressed in severity and frequency.

In March, 1957, abdominal exploration elsewhere disclosed hepatic metastatic lesions and the abdomen was closed. Postoperatively, x-ray studies revealed an obstructing lesion in the ileum. On May 21, she was again operated on elsewhere to relieve intestinal obstruction. She had a stormy postoperative course and seven days later underwent reexploration of the abdomen because of multiple enterocutaneous and colocutaneous fistulas. On June 28, an unsuccessful attempt was made elsewhere to close the fistulas. Her clinical condition continued to decline, the severity of the flushing and sweating episodes increased, and her mental condition deteriorated.

When she was transferred to the clinic on July 26, examination disclosed emaciation, debilitation, dehydration, and confusion. She was perspiring profusely over the head, face, and neck. She had no heart murmurs. There were several abdominal fistulas. Marked excoriation of the skin of the abdominal wall was present from intestinal drainage. Palpation of the abdomen was difficult, but no gross masses could be felt. At admission she had leukocytosis and marked electrolyte imbalance. Quantitative analysis of 1,290 cc. of urine (a 24-hour specimen) yielded 16.9 mg. of 5-hydroxy-3-indole acetic acid. Fluid and electrolyte imbalance was corrected, with progressive improvement in the patient's general condition. The infected abdominal skin cleared after adequate treatment. Surgical closure of the fistulas was advised, but the patient declined closure and requested dismissal.

Table 1—*Effect of Certain Drugs on Urinary Content of 5-Hydroxy-3-Indole Acetic Acid*

Date, 1957	Urine, Cc.	5HIAA, Mg./24 Hr.	Drug Used
			Case 1
3/30	1,830	24.9	...
4/ 1	1,150	13.1	...
4/ 2	570	5.4	...
4/ 5	...	...	Tryptophan, 1 Gm.
4/ 6	630	19.5	...
4/ 7	521	16.2	...
			Case 3
10/23	...	25.2	...
10/24	...	29.0	...
10/26	...	...	Tryptophan, 3 Gm.
10/27	1,590	50.0	...
10/28	1,070	39.0	...
10/29	1,030	41.0	...
10/30	...	32.0	Hydroxyzine hydrochloride, 25 mg., q.i.d.
10/31	...	22.0	Hydroxyzine hydrochloride, 25 mg., q.i.d.
			Case 8
6/12	775	41.0	...
8/22	...	...	Tryptophan, 3 Gm.
8/23	1,130	92.0	...
9/ 3	...	52.0	Reserpine, 0.25 mg., q.i.d.
9/ 4	...	37.0	Reserpine, 0.25 mg., q.i.d.

Case 3.—This patient was initially seen at the clinic in May, 1940, at age 43 for repair of a postpartum rectovaginal fistula. She was next seen in March, 1941, at which time diagnoses of adenomatous goiter without hyperthyroidism and psychoneurosis were made. On a return visit early in 1943 the same diagnoses were made. Later, in April, 1953, she returned because of symptomatic gallstones. Cholecystectomy was performed. At operation the surgeon observed that appendectomy and hysterectomy had been performed previously. There were dense adhesions in the right lower quadrant of the abdomen. Pathological examination of the gallbladder disclosed chronic cholecystitis with moderately thickened and infiltrated walls. Gallstones were present.

The patient was next seen in October, 1957, when she was 60 years old. Since August, 1955, she had had diarrhea characterized by 8 to 15 watery stools in 24 hours. In the spring of 1957, cramping pain had developed in the lower part of the abdomen. Her home physician found a lesion in the cecal region on x-ray examination and advised operation. In August right hemicolectomy and ileocolostomy were performed elsewhere. A diagnosis of carcinoid was made. The surgeon stated that there was a mass in the terminal part of the ileum with involvement of the lymph nodes up to the base of the mesentery and up either side of the aorta. After operation the diarrhea persisted, although the cramping was relieved.

The patient soon experienced episodes of flushing, having had 12 in the two-month period between operation and observation at the Mayo Clinic. She said that the flush occurred over the head, neck, shoulders, thorax, and upper part of the arms and that the skin became deep red "like a lobster;" the skin felt as if it were burning. There was no associated sweating. The episodes usually lasted five minutes but one had lasted an hour. They had awakened her from sleep at night. She knew of no precipitating factors. She said that palpitation and dyspnea were associated with the flush and that the episodes were definitely different from those she associated with menopausal "hot flushes." She had not had asthma. She had lost 28 lb. (12.7 kg.) since operation.

When she was examined at the clinic in October, 1957, her blood pressure was 135 mm. Hg systolic and 90 diastolic, and temperature was 99.2 F (37 C). She was thin, nervous, and tense. A small adenomatous goiter was present. There were multiple abdominal scars, the most recent one being reddened and tender. The edge of the liver was palpable 3 cm. below the costal margin on deep inspiration and was firm. A mass measuring 4 by 6 in. was present in the right lower quadrant. This mass was firm and nontender, and massage did not produce a flush. There were no cardiac murmurs.

Laboratory studies disclosed mild hypochromic anemia, normal serum bilirubin level, normal excretion of sulfobromophthalein, and normal prothrombin time. The results of proctoscopic examination were negative. X-ray examination showed that resection of the cecum had been performed and that an end-to-end ileocolonic stoma was functioning freely. The results of examination were otherwise negative. The x-ray appearance of the thorax was normal. Urinalysis on two occasions yielded 25.2 mg. and 29 mg. of 5-hydroxy-3-indole acetic acid in 24-hour specimens of urine.

Urinary excretion of 5-hydroxy-3-indole acetic acid after administration of tryptophan and various drugs was studied (table 1). Then abdominal exploration was carried out. Many small metastatic implants were found in the liver. Also, [illegible] nodes occupied the root of the mesentery; [illegible] intestine, and these were not resectable. Forty milligrams of a specimen of tissue removed for biopsy and determination of the serotonin content gave a positive reaction for serotonin. Postoperative recovery was uneventful. Diarrhea and flushing were unaffected by hydroxyzine hydrochloride therapy. In January, 1958, the patient stated that her appetite was good and that the diarrhea was less severe. She had gained slightly in weight. Flushes were severe, occurring daily and now involving the entire body. After a flush she felt exhausted and depressed. She was taking chlorpromazine, 25 mg. four to six times a day. She was advised to increase this dosage.

Case 4.—A woman aged 54 who came to the clinic in January, 1958, said that for the past 10 years she had had occasional episodes of hot flushes and sweating. These would occur as often as three times a day for two to seven days and then would not occur for weeks at a time. During the last year the flushes had become more frequent, had occurred several times daily, and had lasted two minutes or more. The episodes would come and go, apparently unrelated to ingestion of food or activity. She stated that during a flush the face, neck, arms, forearms, and thorax would be involved with a florid red, blotchy rash. For the past five months she had noted fulness in the upper part of the abdomen and she had seemed to become full easily with meals. For two months she had diarrhea characterized by 10 to 12 liquid, yellow to green bowel movements per 24 hours. She had lost 30 lb. (13.6 kg.) and appeared slender and tense.

During the examination she flushed several times at intervals of three to five minutes, and each flush lasted for 30 to 60 seconds. During the flush there were diffuse redness and patches of blotchy erythema over the face, neck, upper anterior and posterior parts of the thorax, breasts, arms, forearms, and abdomen. The liver was massively enlarged, hard, coarsely nodular and easily palpable down to the right iliac crest and across the abdomen to the left upper quadrant. The spleen could be palpated 4 cm. below the left costal margin. There was a systolic pulmonic murmur. Massage of the liver produced a flush, as did pelvic and rectal examination. Other than a sulfobromophthalein retention of 10% at the end of one hour, results of studies of the blood and urine were not remarkable. X-ray examination of the thorax showed an elevation of the diaphragm on the right. A plain roentgenogram showed a soft-tissue mass in the upper part of the abdomen, mostly on the right. A 24-hour specimen of urine yielded 11.4 mg. of 5-hydroxy-3-indole acetic acid. The patient was advised of the tentative diagnosis, and further studies were suggested, but she elected to return home without further study.

Case 5.—A 53-year-old woman came to the clinic in January, 1958, with the complaint of chronic cough of 15 years' duration, which had been worse in the past year. Five months before admission she had begun to have hemoptysis which persisted and became a daily occurrence. She had febrile episodes during this period. She wheezed frequently with respiration. For two months she had had substernal distress precipitated by paroxysms of coughing. She was dyspneic after rapidly walking half a block. The blood pressure was 166/96 mm. Hg. There was no cardiac murmur. She denied diarrhea or flushing. The liver was palpable two fingerbreadths beneath the right costal margin.

Studies of the blood and urine gave negative results. Studies of 5-hydroxy-3-indole acetic acid were not done. X-ray examination of the thorax revealed calcification and torsion of the aorta. Cytological examination and culture of the sputum and examination for acid-fast organisms gave negative results. Bronchoscopic examination disclosed a bleeding lesion in the left lower-lobe bronchus; at biopsy this proved to be a bronchial adenoma of the carcinoid type. At left pneumonectomy a high grade 1 adenocarcinoma of the carcinoid type measuring 5 by 3 by 4 cm. was encountered arising in the left lower-lobe bronchus 3.5 cm. below the level of transection of the main bronchus. The tumor had penetrated deeply and eroded into the upper-lobe bronchus. Several nodes immediately adjacent to the tumor were metastatically involved. Hilar nodes were inflamed. The tumor contained 31 mcg. of serotonin per gram.

Case 6.—A 63-year-old woman came to the clinic in February, 1958, with the complaint of a productive cough of two and one-half years' duration. She had been seen here previously, in September, 1951, because of asthma and pneumonitis involving the left base. She had returned in February, 1952, at which time it was found that rheumatoid arthritis had developed in the interval. In September, 1955, she was seen because of rheumatoid arthritis and pulmonary nodules which were thought to be granulomas in the left base.

At the present time the asthma continued unchanged. She denied diarrhea or flushing of the skin. Her home physician had found new nodules on the right side in the course of x-ray examination of the thorax and had referred her for evaluation of her condition.

The patient weighed 161 lb. (73 kg.). Her thought and speech appeared somewhat slowed. Her blood pressure was 150/80 mm. Hg. There were sticky rales at each base posteriorly. The changes of rheumatoid arthritis were evident in the fingers of both hands. The erythrocyte sedimentation rate was 72 mm. per hour (Westergren method). Urinalysis gave negative results. Studies for 5-hydroxy-3-indole acetic acid were not done. X-ray examination showed three masses in the middle lobe of the right lung, and the question was raised as to the presence of small nodules in both pulmonary fields which might be metastatic. At thoracotomy the large circumscribed lesion seen on x-ray examination was found to be in the fissure between the right middle and the right upper lobe. There were also multiple small nodules in the right middle and lower lobes, and consequently these lobes were removed.

The surgical pathologist reported carcinoid with multiple nodules throughout the lung but primarily in the periphery; the largest measured 3 by 2 by 2 cm. and the smallest 0.3 cm. in diameter. The larger tumor contained 86 mcg. of serotonin per gram of tumor, and the smaller tumor contained 62 mcg. per gram. Postoperative urinalysis for 5-hydroxy-3-indole acetic acid gave negative results. The postoperative course was satisfactory until the seventh day when tachycardia, shock, and gastric retention developed, and the patient died in spite of supportive treatment including administration of fluids, electrolytes, steroids, and levarterenol (Levophed) bitartrate.

At autopsy multiple benign adenomas were seen in the remaining right upper lobe. A hepatoma but no metastatic carcinoid nodule was present in the liver. Careful search of the entire gastrointestinal tract did not disclose any carcinoid lesion. There was no evidence of cardiac changes similar to those previously described[1b] in the cusps of the valves of the right side of the heart. There was thrombosis of the portal vein.

Case 7.—This case is reported in detail elsewhere.[25] The patient was admitted to the hospital in October, 1957, because of severe pain and a mass just below the right inguinal ligament and superficial to the right femoral artery. Elsewhere she had undergone subtotal hysterectomy and appendectomy in 1943 and right pneumonectomy for a bronchial adenoma with metastasis to the hilar nodes in January, 1956. The bronchial lesion was of the carcinoid type. She had had recurrent pain in the right upper quadrant since April, 1957, and intermittent diarrhea and flushing episodes since July. The flushes occurred several times a week, involved principally the head, neck, and face, and lasted for periods ranging from 20 or 30 minutes to eight hours. A burning sensation of the face was associated with the flush. Her surgeon wrote that the results of urinalysis for 5-hydroxy-3-indole acetic acid were positive in the fall of 1957.

Physical examination disclosed the following findings: flushing and evidence of acute pain; blood pressure 110/60 mm. Hg; pulse 100; temperature 100 F (37.8 C); right pulmonary space surgically obliterated; no significant heart murmurs; enlarged, hard, coarsely nodular liver; large mass in the region of the gallbladder; a right femoral hernial sac measuring 1.5 by 1.0 cm., which disappeared while it was being examined; negative rectal findings; and absence of edema of the extremities.

Laboratory studies revealed hypochromic anemia; normal urine; retention of sulfobromophthalein, 18%; serum alkaline phosphatase level, 17.7 King-Armstrong units; rate of sedimentation of erythrocytes, 60 mm. per hour (Westergren method); and the presence of 5-hydroxy-3-indole acetic acid in the urine. X-ray examination disclosed that pneumonectomy had been performed on the right and that the left lung was clear. The gallbladder was nonfunctioning, according to x-ray evidence, and it contained stones. The referring physician kindly loaned sections of previously resected tissues which were reviewed by Dr. M. B. Dockerty, who reported evidence of chronic cervicitis, fibrosis of the uterus, and chronic fibrous appendicitis with no evidence of carcinoid from the organs removed in 1943; a primary bronchial adenoma of the carcinoid type was present in the specimen obtained at pneumonectomy in 1956.

Abdominal exploration on Nov. 4, 1957, disclosed a markedly enlarged liver with massive amounts of metastatic tumor tissue. One mass just above the inferior margin of the liver measured 8 cm. in diameter and was fluctuant but was distinctly not the gallbladder. A smaller superficial nodule was removed for biopsy. It was elected not to aspirate the large fluctuant mass. Inspection of the entire small intestine, cecum, and a portion of the transverse colon did not reveal any primary lesion or mesenteric nodal metastasis. The nodule removed from the liver was found to be metastatic grade 1 adenocarcinoma, carcinoid type.

Postoperative recovery was satisfactory. Flushing was temporarily relieved by the administration of chlorpromazine but became bothersome again after the patient was dismissed from the hospital.

Case 8.—A middle-aged man, who was initially seen at the clinic in June, 1957, gave the history that in September, 1945, 30 in. of the small intestine had been removed because of Meckel's diverticulum and carcinoid with obstruction and metastasis to lymph nodes. Six months later he began to have episodes of low abdominal crampy pain with the characteristics of intermittent, incomplete obstruction of the small intestine. Over ensuing years the episodes became more frequent and of longer duration until they precipitated his admission to the clinic. He denied flushing, asthma, swelling, or symptoms of impaired cardiac reserve. The only diarrhea he had experienced had occurred as episodes of partial obstruction subsided, at which time he would have two or three loose, watery movements during 24 hours, and then he would be entirely free from diarrhea until the next episode of incomplete obstruction.

Examination revealed blood pressure 122/80 mm. Hg; no heart murmurs; tenderness in the right lower quadrant of the abdomen; liver not palpable; no peripheral edema; no flushing; complete blood cell count normal; urine normal; liver function normal; x-ray appearance of the entire gastrointestinal tract normal; proctoscopic findings normal; absence of parasites and ova in the stools; and 41 mg. of 5-hydroxy-3-indole acetic acid in a 24-hour volume (775 cc.) of urine.

Exploration was advised, but the patient elected to defer this procedure. He returned in August, 1957. After oral administration of 3 Gm. of tryptophan, a 24-hour specimen of urine (1,130 cc.) on Aug. 23 yielded 92 mg. of 5-hydroxy-3-indole acetic acid (table 1). Exploration the next day disclosed recurrent and metastatic carcinoid of the ileum. Nodules were present in the liver. The terminal portion of the ileum, including the tumor, and the right side of the colon were resected, and ileotransverse colostomy was performed. The tumor tissue contained 545 mcg. of serotonin per gram. Postoperatively the urine continued to contain 5-hydroxy-3-indole acetic acid. After administration of 0.25 mg. of reserpine four times a day the urine contained 52 mg. of this substance on Sept. 3 and 37 mg. on Sept. 4. The patient continued to be entirely free of any symptoms of functioning carcinoid.

Cases 9, 10, 11, and 12 have been reported elsewhere.[20]

Clinical Features

According to the criteria described by Thorson and co-workers[3] and confirming observations by many authors, cardinal symptoms or findings include the flushing phenomenon, diarrhea, history of episodes of asthma, enlargement of the liver, dependent edema, and auscultatory findings compatible with pulmonic stenosis or tricuspid insufficiency or both. Not all these features need be present simultaneously. In addition, abnormal amounts of 5-hydroxy-3-indole acetic acid should be demonstrable in the urine, and, if facilities are available, abnormal amounts of 5-hydroxytryptamine can be demonstrated in the blood or in tumor tissue. Needle biopsy of the liver may yield evidence of metastatic carcinoid tissue.

On the basis of the 12 patients (table 2) represented in this report the following information seems pertinent to diagnosis.

History.—A history compatible with previous episodes of intermittent incomplete obstruction of the small intestine may be obtained; thus, four of eight patients whose carcinoid was primary in the abdomen in our group of patients had been previously operated on elsewhere for this reason. Examination of tissue so removed will indicate the nature of the lesion.

Flushing.—A peculiar cutaneous flushing has been described by all who have written on this syndrome. It is perhaps the most outstanding physical finding when it is present, and remarkable descriptive terms have been applied to it.[20]

TABLE 2.—*Features in Twelve Cases*

Feature	1	2	3	4	5
Flush	+	+	+	+	0
Diarrhea	0	0	+	+	0
Asthma	0	0	0	0	+
Heart murmur	0	0	0	Systolic pulmonic	0
Palpable liver	0	+	+	+	+
Abdominal mass	0	0	+	0	0
5-HIAA* in urine	+	+	+	+	Not examined
Serotonin in tumor, µg./Gm.	No data	Operation refused	Positive†	Operation refused	31
Carcinoid on biopsy	+	+	+	Operation refused	+
Proved metastasis	Mesenteric nodes, liver	Liver	Mesenteric nodes, liver	Operation refused	Liver
Primary lesion, site	Ileum	Ileum	Ileum	Probably small intestine	Left lower lobe of bronchus

* 5-HIAA = 5-hydroxy-3-indole acetic acid.
† Positive reaction obtained with 40 mg. of tumor tissue.
‡ Operation performed elsewhere.

Nine of our 12 patients presented historical and objective evidence of flushing at the time of examination and diagnosis. This symptom had been observed for periods ranging from a few months to 10 years. Flushes varied considerably in intensity, duration, and distribution. Some lasted only 30 to 60 seconds while others continued for several days; the majority lasted for only a few minutes. Two patients flushed almost constantly for a few months prior to death; the wife of one patient stated that he appeared very "red and healthy" as though he had a fresh sunburn and that he looked this way until he died.

Associated with the flush is an intense feeling of warmth, and at times rather severe perspiration occurs with the flush. Usually the head, neck, thorax, and arms are involved, though we have observed generalized flushing over the entire body. During a flush the skin appears florid. The scleras are injected. Red, blotchy, geographical areas with nonelevated edges may appear. These areas tend to fade from the center to the periphery, the central portion at first becoming dusky cyanotic before all color disappears and leaves this portion the color of normal white skin. At first glance these areas simulate giant hives, but they are not elevated above the surface of the skin.

There are reports that flushing can be precipitated by alcoholic beverages, hot drinks, eating, defecation, anger and anxiety, and by palpation of the enlarged liver or intra-abdominal tumor. However, investigators[21b] failed to demonstrate an increase of 5-hydroxytryptamine in the blood after ingestion of alcohol or food.

Diarrhea.—Diarrhea of varied severity occurred in 6 of the 12 patients. The number of stools ranged from a few to as many as 20 to 30 watery, yellow to green foul movements in 24 hours. When severe, diarrhea may occur at night as well as during the day; it is not bloody.

Asthma.—Three of the 12 patients gave histories of asthmatic attacks. The attacks were not severe and yielded readily to the usual medical measures. It has been suggested that the use of epinephrine be avoided in these patients.

Pulmonic Systolic Murmur.—Three of our patients had a significant pulmonic systolic murmur, and two of these patients have died. Autopsy performed in one of these two patients did not disclose any significant change in the valves of the right side of the heart.

MacDonald[1b] reported that in 34 of the 57 cases of functioning carcinoid he reviewed there were proved, isolated, nonrheumatic lesions of the valves of the right side of the heart (or combined lesions on the right and left sides in the event of patent foramen ovale).

Liver Enlargement.—Enlargement of the liver with what was thought to be metastatic involvement at the time of physical examination was observed in 7 of the 12 patients. Involvement was proved surgically in 10 of the 12. One patient who refused exploration had a huge nodular liver that undoubtedly was involved in the metastatic process. In the only case in which the liver was proved surgically not to be involved and in which the postoperative urinary levels of 5-hydroxy-3-indole acetic acid were normal, the carcinoid was in the gastrointestinal component of an ovarian teratoma.

Functioning Tumor Tissue Without Clinical Manifestations.—Functioning tumor tissue without clinical manifestations may be encountered, as in case 8. This case illustrates that large amounts of serotonin may be produced and that the urine may contain large amounts of 5-hydroxy-3-indole acetic acid in the absence of signs or symptoms of functioning carcinoid. Eventually this patient probably will have such signs and symptoms, but it seems at present that some bodily mechanism protects him from the abnormal amounts of serotonin being secreted. This case also indicates the value of postoperative determination of urinary 5-hydroxy-3-indole acetic acid in demonstrating the presence of metastatic functioning tumor tissue.

Site of Primary Lesion.—The site of the primary lesion was the small intestine in 7 of the 12 patients, the lesion being in the ileum in 5, in the jejunum in one, and in an unrecorded part in one. The primary lesion was in the cardia of the stomach in one patient, in the gastrointestinal component of an ovarian teratoma in one, and, of most interest, in the lung in three, where apparently it was the carcinoid type of bronchial adenoma. The tumor tissue from the lung contained 31 mcg. per gram in one of the last three patients, and 86 and 62 mcg. per gram in another patient from whom two specimens were examined. The pulmonary lesion in the third patient was surgically removed elsewhere, and we did not have occasion to measure the tissue content of serotonin, though the tissue was reviewed and proved to be a bronchial adenoma of the carcinoid type on microscopic examination.

of Functioning Carcinoid Tumor

Case						
6	7	8	9	10	11	12
0	+	0	±	+	+	+
0	+	0	+	0	+	+
+	0	0	0	+	0	0
0	0	0	0	Systolic pulmonic	Systolic pulmonic	0
0	+	0	+	+	0	0
0	0	0	+	0	0	+
Not examined	+	+	+	+	+	+
86, 62	No data†	545	No data	40	2,120	520
+	+	+	+	+	+	+
None (multiple adenomas of lung)	Liver	Liver	Mesenteric nodes, liver	Liver	None	Mesenteric nodes, liver
Lung, R. middle & lower lobes	Lung, R. lower lobe	Ileum	Ileum	Stomach	Teratoma, left ovary	Jejunum

Laboratory Aspects

From the laboratory standpoint, confirmation of the clinical diagnosis of functioning carcinoid can be made by detecting abnormal amounts of 5-hydroxy-3-indole acetic acid in the urine. Reference was made to the simple qualitative test to demonstrate the presence of this substance. It was found subsequently that this is a reliable test. Mohler[27] examined 1,120 specimens of urine from 1,023 patients and found that none gave the characteristic purple color, nor was any drug encountered which caused this color and thereby gave a false-positive reaction. He concluded that this qualitative test was highly specific for confirming the presence of metastatic carcinoid. If the results of the test are positive, the more informative quantitative determination[17] of the urine should be made. A 24-hour specimen of urine normally contains 2 to 9 mg. Higher values are abnormal.

It recently was reported[28] that ingestion of bananas led to increased excretion of 5-hydroxy-3-indole acetic acid in monkeys and in two children. Therefore one must be certain that bananas are not eaten during the period represented by the specimen of urine being collected.

In 10 of our 12 cases, qualitative tests gave positive results and quantitative tests yielded amounts of 5-hydroxy-3-indole acetic acid varying from 12 to 14 mg. to more than 280 mg. in 24 hours. In two cases this test was not done before operation. Further confirmation of the diagnosis can be obtained by analysis of the tumor for serotonin.

Three patients whose urine contained abnormal amounts of 5-hydroxy-3-indole acetic acid were given tryptophan after surgical proof of the presence of carcinoid. The tryptophan was administered in the morning, usually with breakfast. The effect of ingestion of this substance and also hydroxyzine and reserpine on the urinary content of 5-hydroxy-3-indole acetic acid is shown in table 1. The increase of the 5-hydroxy-3-indole acetic acid in the urine was small. This confirms previous observations by Udenfriend and suggests that tryptophan may be administered as a loading test, and if a functioning carcinoid is present, the majority of the administered tryptophan should be diverted over the serotonin pathway to the formation of serotonin and eventual degradation to 5-hydroxy-3-indole acetic acid, which will be present in somewhat increased amounts in the urine.

An additional confirming test has been proposed by Rotbart.[29] This test is based on the altered reactivity of the skin to serotonin. He injected serotonin creatinine sulfate intradermally in the arms of two patients with functioning carcinoid. In the opposite arms of these patients he injected histamine phosphate and saline solution intradermally. He found that serotonin produced huge reactions with marked erythema on the flexor surface of the forearm and cyanotic fingertips in one patient. In the other there was marked erythema over a large area. In neither patient were the controls with histamine or saline solution comparable to the reactions induced by serotonin. Histamine wheals developed in 25 normal persons treated in a similar fashion, but the areas of erythema at the site of serotonin injections were no larger than the control areas. He proposed the thought that patients with malignant carcinoid syndrome hyperreact to intradermally administered serotonin as compared to the reaction of normal persons.

Management

The management of these patients presents many difficulties. It is felt that surgical removal of as much of the malignant tissue as possible is indicated. This should be done, especially where there are large metastatic masses involving mesenteric glands, in an effort to remove enough bulk of the tumor to reduce serotonin formation and thereby lessen symptoms. Caution in surgical intervention must be exhibited. Stacey [30] reported two instances in which an attack ultimately leading to death of the patient developed at an early stage in operation before any tumor tissue was manipulated. Similar difficulties have been encountered by Waugh.[31]

Much hope has been held that some of the reported antagonists of serotonin would be of value. As reported previously, our experiences with chlorpromazine have not been promising. According to others, brominated lysergic acid diethylamide has been tried, but Bean and Funk [26] did not note any change in signs or symptoms or diminution of excretion of 5-hydroxy-3-indole acetic acid after its use. They also reported a trial of 1-benzyl, 2-methyl, 5-methoxytryptamine hydrochloride in doses of 25 mg. three times a day for two weeks at a time without clinical effect or significant change in excretion of 5-hydroxy-3-indole acetic acid. We have used as much as 200 mg. of chlorpromazine a day and also hydroxyzine without any significant improvement.

Smith and co-workers [21b] stated that brominated lysergic acid had little clinical effect in their cases, although one patient appeared to excrete less 5-hydroxy-3-indole acetic acid. They also noted that reserpine provoked an over-all increase in flushing and frequency of bowel movements and that initially there was a marked increase in excretion of 5-hydroxy-3-indole acetic acid followed by a marked decrease, suggesting a period of relative depletion in the tissue. They proposed that this might be useful as a provocative test in nonsecreting cases.

Symptomatic measures may be helpful in attempts to control the diarrhea. The tranquilizing effect of chlorpromazine may have some value in this respect. Stacey [30] has stated that since excitement and norepinephrine may precipitate asthmatic attacks in these patients, the use of this drug in the treatment of bronchospasm may be inadvisable. If large amounts of histamine are being excreted in the urine, administration of one of the antihistaminics may be of value.

X-ray and radioisotope therapy have been tried in an effort to destroy metastatic tissue and reduce amounts of circulating serotonin. Two of our patients received extensive x-ray therapy with no obvious help. Stacey [30] reported on two patients who received x-ray therapy without benefit and with actual deterioration, though he stated that two additional patients received temporary amelioration after administration of radioactive gold.

Summary

The syndrome of functioning carcinoid is being recognized more frequently as knowledge of the clinical features and of confirmatory laboratory procedures is being more widely disseminated. The tumor functions in the same fashion as an endocrine tumor as a result of its secretion of serotonin.

Not all the clinical features need be present simultaneously to make the diagnosis. Demonstration of abnormal amounts of 5-hydroxy-3-indole acetic acid in the urine confirms the diagnosis. The amounts of this substance present in the urine may vary from time to time, and more than one determination may be necessary. Postoperative urinary determinations are of value in suggesting the development of metastasis.

The treatment of choice is surgical removal of all or of as much of the tumor tissue as is possible, to reduce the amount of serotonin secreted. Irradiation therapy is of doubtful value. To date, the "serotonin antagonists" have not been of aid in medical management. Symptomatic measures for relief of diarrhea, pain, and asthma are indicated.

The primary site of the lesion is usually the gastrointestinal tract, frequently the ileum. Three cases are presented in which the primary lesion in the patient was probably a bronchial adenoma of the carcinoid type.

Functioning carcinoids may exist with none of the clinical manifestations of the syndrome, as in case 8, in which large amounts of serotonin were present in tumor tissue and high urinary values for 5-hydroxy-3-indole acetic acid were found in the absence of any clinical evidence of the syndrome.

References

1. (*a*) Dockerty, M. B.: Carcinoids of Gastrointestinal Tract, Editorials, Am. J. Clin. Path. **25:**794-795 (July) 1955. (*b*) MacDonald, R. A.: Study of 356 Carcinoids of Gastrointestinal Tract: Report of Four New Cases of Carcinoid Syndrome, Am. J. Med. **21:**867-878 (Dec.) 1956.

2. Biörck, G.; Axen, O.; and Thorson, A.: Unusual Cyanosis in Boy with Congenital Pulmonary Stenosis and Tricuspid Insufficiency: Fatal Outcome After Angiocardiography, Am. Heart J. **44:**143-148 (July) 1952.

3. Thorson, A.; Biörck, G.; Björkman, G.; and Waldenström, J.: Malignant Carcinoid of Small Intestine with Metastases to Liver, Valvular Disease of Right Side of Heart (*Pulmonary Stenosis* and *Tricuspid Regurgitation* Without Septal Defects), Peripheral Vasomotor Symptoms, Bronchoconstriction, and Unusual Type of Cyanosis: Clinical and Pathologic Syndrome, Am. Heart J. **47:**795-817 (June) 1954.

4. Erspamer, V.: Pharmacology of Indolealkylamines, Pharmacol. Rev. **6:**425-487 (Dec.) 1954.

5. Rapport, M. M.; Green, A. A.; and Page, I. H.: Crystalline Serotonin, Science **108:**329-330 (Sept. 24) 1948.

6. Rapport, M. M.: Serum Vasoconstrictor (Serotonin): V. Presence of Creatinine in Complex. Proposed Structure of Vasoconstrictor Principle, J. Biol. Chem. **180:**961-969 (Oct.) 1949.

7. Hamlin, K. E., and Fischer, F. E.: Synthesis of 5-hydroxytryptamine, Communications to the Editor, J. Am. Chem. Soc. **73:**5007-5008 (Oct.) 1951.

8. Erspamer, V., and Asero, B.: Identification of Enteramine, Specific Hormone of Enterochromaffin Cell System as 5-hydroxytryptamine, Nature, London **169:**800-801 (May 10) 1952.

9. Lembeck, F.: 5-hydroxytryptamine in Carcinoid Tumour, Letters to the Editors, Nature, London **172:**910-911 (Nov. 14) 1953.

10. Page, I. H., and McCubbin, J. W.: Variable Arterial Pressure Response to Serotonin in Laboratory Animals and Man, Circulation Res. **1:**354-362 (July) 1953.

11. Comroe, J. H., Jr.; Van Lingen, B.; Stroud, R. C.; and Roncoroni, A.: Reflex and Direct Cardiopulmonary Effects of 5-OH-tryptamine (Serotonin): Their Possible Role in Pulmonary Embolism and Coronary Thrombosis, Am. J. Physiol. **173:**379-386 (June) 1953.

12. Gaddum, J. H.: Tryptamine Receptors, J. Physiol. **119:**363-368 (Feb. 27) 1953.

13. Erspamer, V.: Observations on Fate of Indolalkylamines in Organism, J. Physiol. **127:**118-133 (Jan. 28) 1955.

14. Page, I. H., and others: Argentaffinoma as Endocrine Tumour, Lancet **1:**198-199 (Jan. 22) 1955.

15. Sjoerdsma, A., and Udenfriend, S.: Studies on Indole Metabolism in Patients with Malignant Carcinoid (Argentaffinoma), Abstracts, J. Clin. Invest. **34:**914-915 (June) 1955.

16. Sjoerdsma, A.; Weissbach, H.; and Udenfriend, S.: Simple Test for Diagnosis of Metastatic Carcinoid (Argentaffinoma), J. A. M. A. **159:**397 (Sept. 24) 1955.

17. Udenfriend, S.; Titus, E.; and Weissbach, H.; Identification of 5-hydroxy-3-indoleacetic Acid in Normal Urine and Method for Its Assay, J. Biol. Chem. **216:**499-505 (Oct.) 1955.

NOTE: References 18 to 31, inclusive, will be provided by the authors on request.

EFFECT OF COMPETITIVE INDUSTRIAL ACTIVITY ON SEVERELY DISABLED CARDIAC PATIENTS

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Much has been written in the recent medical literature regarding the employment and productivity of the cardiac patient, yet there has been no controlled study to evaluate the effect of competitive industrial activity on the diseased heart. Kline[1] gave a complete and detailed discussion on the method by which the problem of placement and evaluation had been successfully approached by the Work Classification Clinic of the Cleveland Heart Society. Hellerstein and Ford,[2] studying the oxygen consumption for workers in many listed so-called laboring jobs, found that this consumption is only two to three times the resting levels except for very short periods of time. Laplace[3] concluded that persons who have heart disease of slight to moderate severity are almost always capable of undertaking useful work.

Kline,[4] concerned with rehabilitation, stated that 45% of patients referred in the 2C to 3C classification (American Heart Association) were able to return to normal work activity. Black[5] said that the social and psychological conditions of the patient, his motivation and interest, are frequently much greater determinants for success in rehabilitation than the extent of his organic heart disease.

Employers are reluctant to hire persons with cardiac disease even if they do not have a definite policy against it. Reasons for the reluctance in hiring these persons are reported to be that the physical demand of work exceeded the physical capacity of the cardiac patient; there is risk of monetary loss arising out of compensation claims; it is considered that cardiac patients are a heavy burden on company-sponsored insurance programs; there is insufficient medical staff; and it is not in accordance with the policy of the personnel department. Frequently, the detrimental effect of the psychological and emotional stress of a patient after ill-advised activity restriction is actually greater than that due to the cardiac involvement per se. The elimination of fear about heart disease is thought to be the major problem faced by the general practitioner in his efforts to rehabilitate patients with cardiovascular disease.

From the Human Resources Corporation, a division of Abilities, Inc.

Chapman,[6] of the U. S. Public Health Service, stated that most research has arrived at understanding the etiology of the heart disease and that added recent research studies explore the relationship between work and the development of heart disease, how best to measure the residual work capacity of the diseased heart, and how to relate the reserve capacity to the job demand.

Under a grant by the North America Insurance Company, a recent study was undertaken at Abilities, Inc., of Albertson, Long Island, N. Y., to evaluate the effect of work effort on the severely disabled cardiac patient. A detailed study was performed to evaluate the effect of competitive employment on the specific cardiac disabilities. This report first considers 10 patients with postmyocardial infarction with a history of one or more attacks and with varying degrees of myocardial decompensation. These persons would be considered unemployable in industry.[7] Also included in this study are the cases of seven persons with rheumatic heart disease and two with hypertensive heart disease.

TABLE 1.—*Employment and Illness Data for Ten Men with Myocardial Infarction Employed at Abilities, Inc.*

			Work		Travel			Employment Data*			Illness Data	
Case	Age, Yr.	Disease	Type	Effort Required	Time, Min.	Distance, Miles	Mode	Time Employed	Period of Evaluation, Yr.	Absence due to Specific Illness, Days	Degree of Change	Anginal Attacks
1	62	Myocardial infarction (1951); hypertension; angina pectoris after exertion; class 2C	Office	Active	45	19	Drives	9/56—present	1 5/12	None	Compensated; no change	Minimal attacks since employment; no glyceryl trinitrate taken in 3 months
2	52	Myocardial infarction (1957); angina pectoris; congestive heart failure; class 3C	Bench work, coil winding	Sitting job	40	20	Drives	11/56—3/3/58	1 1/6 ...	...	Change from class 2B when employed to 2A	Need for glyceryl trinitrate dropped from 15+ tablets per day to 1-5; stroke occurred 2/25/58 at home; died 3/3/58
3	62	Myocardial infarction (1951); disabled 4½ yr.; class 3C	Bench work, electrical	Sitting job	20	10	Car pool	4/56—3/58	1 5/6	14	Walking endurance increased from ½ to 4 blocks; little dyspnea	None
4	59	Myocardial infarction (1938); angina pectoris with and without effort; second attack, 1954; digitalis and glyceryl trinitrate therapy; class 3C	Electronics	Sitting job, moderate activity	35	11	Drives	5/57—present	1 3/4	None	Definite improvement; change from class 3B when employed to 2B	Need for glyceryl trinitrate dropped from 10+ tablets daily to only 6 in 3 months
5	26	Myocardial infarction (1954); familial hypercholesteremia; angina pectoris on effort; second attack, 1955; class 2B	Office	Walking, etc.	20	5	Drives	9/56—present	1 5/12	15½	Compensated; pentaerythritol and heparin prescribed	4-5 attacks daily increased to 5-10 since employment
6	63	Coronary artery disease; infarction (1939); left hemiplegia, 1952; compensated; premature ventricular contractions	Coil winder	Sitting and some standing	15	7	Drives	3/56—3/58	1 3/4	None	Compensated; left hemiplegia; no change	None
7	56	Myocardial infarction (1953); compensated	Mechanical	Sitting job	30	12	Drives	2/56—present	2	6	Compensated; no change	None
8	48	Myocardial infarction (1955); second attack, 1955; compensated	Office, purchasing	Active	30	12	Drives	4/56—present	1 5/6	None	Compensated; no change	None
9	60	Myocardial infarction (1956); angina pectoris on effort; hypertrophied heart; compensated	Electrical	Sitting job, active	30	7	Car pool	4/56—present	1 5/6	None	Compensated; less premature ventricular contractions	Attacks rare when working; walking endurance from ½ to 6 blocks
10	62	Myocardial infarction (1952); auricular fibrillation; enlarged heart; irregular rhythm; class 3B	Bench work, mechanical	Sitting job	45	12	Car pool	8/53—present	4 1/2	None	Class 2B when employed; no change	None

* All were examined in September, 1957; none had compensable accident rate.

Postmyocardial Infarction

Table 1 shows employee and employment data and degree of change that has taken place in the specific disability of 10 patients since being employed. In these patients, all with heart disability due to coronary artery disease with myocardial infarction, the age spread was from 26 to 63 years. One patient was 26 years of age, one was 48, and the rest were over 50. Each patient revealed some degree of decompensation at rest while receiving medical therapy. All have or have had electrocardiographic evidence of myocardial infarction. The elapsed time from the first incident of infarction to the time of writing ranged from 1 to 10 years. Three persons had a history of proved secondary attack. There is a wide range in the type of work performed by these employees. It will be seen from table 1 that many of the employees were physically active as far as walking is concerned, but none of them were employed in any occupation that requires heavy labor. The travel time, distance traveled, and mode of travel have been recorded. The strain of driving or riding (by means of a car pool) through heavy city traffic may be a factor in the final evaluation of the progress made by these employees. The time traveled ranged from a minimum of 15 to a maximum of 45 minutes each day. The distance traveled ranged from a miniumum of 5 to a maximum of 30 miles. Seven of these employees drove their own cars, whereas only three were driven to work by means of a car pool.

All of these employees had been at Abilities, Inc., for more than one year except for one (case 4), who was employed in May, 1957. The absenteeism due to the specific illness may be noted to be somewhat remarkable. There was one death (case 2); the patient sustained a cerebral embolism on Feb. 27, 1958, while at home, and died March 3, 1958. This employee had, in the previous week, been trapped in a snowstorm in his car and exerted himself to a rather high degree for over one and one-half hours. This had precipitated a mild left ventricular failure which required several days' rest at home. Although he returned to work after the episode, for some reason he did not fully recover. In the list of compensable accident rate, it will be noted that not one of these employees sustained an accident while employed at Abilities, Inc.

Four patients have shown no evidence of any change in cardiac status since employment. One patient (case 9), who had an enlarged heart with multiple premature ventricular contractions, which condition was compensated, on reexamination revealed less premature ventricular contractions, to the degree that they were now only rarely found. The patient in case 2, who had congestive heart failure and improved so remarkably, was the man who died March 3, 1958, from cerebral embolism. The 62-year-old patient in case 3 had rather severe coronary artery disease with myocardial infarction and evidenced an advanced decompensation manifested by edema, dyspnea on effort, digitalis bradycardia, and fluid in his chest. He required meralluride (Mercuhydrin) sodium injections three times weekly and, at the time of writing, finds that his walking endurance has increased from one-half to four blocks with very little dyspnea.

Table 1 reveals that 5 of the 10 listed patients with postmyocardial infarction who were employed at Abilities, Inc., showed no change since being employed, 3 showed definite improvement, 1 died, and 1 (case 5) seemed to have an increase in anginal attacks but no increase in disability. The column on anginal attacks is remarkable in several respects. It will be noted that four out of five persons who had anginal attacks were very definitely improved in spite of an increase in their physical activity. The 62-year-old man in case 1, who showed no change in his myocardial status and who had a history of multiple angina attacks on effort (mild effort produced attacks requiring glyceryl trinitrate [nitroglycerin] therapy), found that since the time of employment these attacks have been minimal. He has not had to take any glyceryl trinitrate tablets at all during the three months prior to time of writing. A similar history was obtained from the employee in case 4; frequent anginal attacks which required 10 to 15 glyceryl trinitrate tablets daily have, since the time of the patient's employment, been reduced markedly. This patient has taken only six tablets of glyceryl trinitrate during the three months prior to time of writing.

Case 2.—A 52-year-old man was employed at Abilities, Inc., in November, 1956, in a sitting job. His medical history showed that he sustained a myocardial infarction in 1951, accompanied by congestive heart failure. He had angina pectoris on effort, requiring 15 to 30 tablets of glyceryl trinitrate daily. He was on a salt-free diet but exhibited symptoms of congestive heart failure, that is, shortness of breath after exertion, orthopnea, and edema of both lower extremities.

Since employment, he had been on therapy with a rigid salt-free diet and one tablet of pentaerythritol tetranitrate-alseroxylon (Pentoxylon) three times a day. He drove back and forth to work each day. This man had been unemployed for 16 months prior to being hired by Abilities, Inc., because of his chronic congestive heart failure. At the time of the examination, he had noticed a marked improvement in his ability to walk several blocks without undue breathlessness. Roentgenograms of the heart and chest showed a myocardial enlargement of moderate degree, with some perihilar congestion but no free fluid.

He had suffered one mild attack of left ventricular failure. This followed prolonged exposure during a snowstorm when he could not start his car. He was put on chlorothiazide (Diuril) therapy, 500 mg. three times a day, and responded so well that he was back to work in four days. An electrocardiogram taken on Feb. 24, 1958, did not reveal any new infarction, but on Feb. 27, 1958, he developed a left-sided hemiplegia while at home. He died on March 3, 1958.

The only change in the medical regimen of this employee since he was hired was the addition of pentaerythritol-alseroxylon and the advice of more rigid control of his salt intake. The effect of employment had certainly not been detrimental, and his condition was satisfactory until he exerted himself violently during the snowstorm previously mentioned.

Case 3.—A 62-year-old man developed a myocardial infarction in 1951, at which time he was hospitalized for 31 days. He had a grade 4 decompensation and was kept at home until April, 1956. During his home care, he was constantly digitalized and received mercurial injections three times a week. He exhibited orthopnea, cyanosis of the skin, and a short, disturbing cough. He developed diabetes mellitus in 1953. Electrocardiograms revealed extensive heart damage, left ventricular hypertrophy, evidence of old myocardial infarction, digitalis bradycardia, first degree heart block, and intraventricular conduction delay.

He was employed at Abilities, Inc., on April 16, 1956, without receiving a preemployment physical examination. He was examined on Jan. 29, 1957, at which time he revealed moderate dyspnea on effort, no cyanosis, moderate pallor, blood pressure of 140/100 mm. Hg, and no neck vein pulsations. The heart was enlarged to the left in the sixth interspace to the mid-axillary line. No thrills were palpable. The sounds were regular, with only occasional premature contractions. The rate was 80 beats per minute. There was a grade 2 apical systolic murmur, with no radiation. Examination of the lungs revealed dulness at the right base, with diminished breath sounds; no rales were audible. The abdomen was obese; the liver was enlarged four fingerbreadths, there was no fluid wave nor shifting dulness, and no hernia was found. There was edema (3+) of both lower extremities from the foot to the knee.

The patient was reexamined in November, 1957. Therapy with digoxin, 0.25 mg. was reduced from one dose per day to one every other day, while that with acetazolamide (Diamox) was reduced to 250 mg. taken in the morning every other day. His mercurial injections were reduced from three weekly to one a week. There was no change in the heart size, but the premature heart beats were now rarely heard. The liver was no longer enlarged, and the edema was now confined to the ankles only and was rated as 1+. His diabetic status since the time of employment has been controlled by diet. Breathlessness on effort, however, was still present at the time of writing.

The patient has shown dramatic improvement since being employed. Although formerly considered a completely decompensated individual who had been forced to remain at home for four and one-half years after his myocardial infarction, he has shown remarkable clinical improvement during the time he has been gainfully employed.

TABLE 2.—*Employment and Illness Data for Seven Persons with Rheumatic Heart Disease Employed at Abilities, Inc.*

			Work		Travel			Employment Data‡			Illness Data	
Case*	Age, Yr.	Disease†	Type	Effort Required	Time, Min	Distance, Miles	Mode	Time Employed	Period of Evaluation, Yr	Absence due to Specific Illness, Days	Disease Stability and Compensation†	Specific Effect of Work
11	37	Rheumatic heart disease; auricular fibrillation; hypertrophied heart; mitral insufficiency; mitral stenosis; class 3C	Inspector	Walks, sits	30	11	Drives	4/57—present	5/6	14 ½	Taking digitalis, mercurials; regulated diet	Condition generally improved, needs less mercurials, but still requires digitalis, salt free diet; dependent edema almost negligible
12	24	Rheumatic heart disease; hypertrophied heart; mitral insufficiency; mitral stenosis; auricular fibrillation; aortic insufficiency, class 3B	Office work, messenger	Walks, sits	40	15	Drives	9/57—present	5/12	4	Laryngoparalysis, recurring nerve on one side causing hoarseness; pulmonary infarction, 1955 Prescribed less salt in diet, digitalis, prophylactic penicillin therapy	No change
13	56	Rheumatic heart disease; aortic stenosis; mitral insufficiency; mitral stenosis; valvulotomy, 2/14/56; RSR; class 3A	Bench work, electrical	Sits	25	15	Drives	9/57—3/58	5/12	3 (2 mo - leave of absence)	No change	Condition improved since employment; only medication is penicillin prophylactically
14	22	Rheumatic heart disease, aortic stenosis, mitral insufficiency; mitral stenosis; enlarged heart, RSR; class 3B	Mechanical	Walks, sits	20	6	Car pool	6/56—2/58	1 ⅔	None	Prescribed digitalis, 0 1 mg daily, less salt in diet, prophylactic penicillin therapy, RSR	No change
15	55	Rheumatic heart disease; auricular fibrillation; mitral insufficiency; enlarged heart; class 3B, diabetes mellitus requiring insulin	Bench work, harness and cable department	Sits	30	7	Car pool	5/56—present	1 ¾	2	Takes digitalis and insulin	No change
16	43	Rheumatic heart disease; hypertrophied heart; auricular fibrillation; mitral insufficiency; class 3B	Bench work, electrical	Sits	20	8½	Drives	4/57—present	5/6	2	Takes digitalis daily	No change
17	43	Rheumatic heart disease, aortic stenosis; RSR; class 2B	Packaging	Heavy activity, lifting, operates machinery	30	10	Drives	2/56—present	2	None	Change to class 1B	No change

*All were men except patient in case 15

†RSR=Regular sinus rhythm

‡All were examined in September, 1957, none had compensable accident rate

CASE 4.—A 59-year-old man was employed in May, 1957, at a job where he sits all day and does light manual labor. His history revealed that he sustained a myocardial infarction in 1948 and a secondary attack in 1954 He had been completely disabled for two years prior to being employed at Abilities, Inc. He had multiple attacks of angina pectoris with and without effort. These attacks were relieved by sublingual administration of glyceryl trinitrate, and he takes 0.2 mg. of digitoxin daily at present.

He was examined on Sept. 9, 1957, four months after beginning his present work. At that time, he revealed shortness of breath on effort but no edema and no nocturnal dyspnea. He used only 6 glyceryl trinitrate tablets in the following six months, whereas previously he used 5 to 10 tablets daily. Examination revealed a well-nourished, gray-haired man. There was a moderate degree of arcus senilis and no neck vein pulsation. The heart was enlarged to the left anterior axillary line in the sixth interspace, and no thrills were palpable. The first heart sound at the apex was soft, while the second sound was accentuated and snappy. There was a harsh, shrill, grade 4 apical systolic murmur, with radiation to the left axilla, and regular sinus rhythm at the rate of 82 beats per minute. The lung fields were clear, the liver was not enlarged, and the blood pressure was 184/130 mm. Hg.

This man showed little change in his physical status after a period of employment. However, there was a definite improvement in his sense of well-being and a decrease in number of anginal attacks.

Rheumatic Heart Disease

Table 2 lists seven employees with rheumatic heart disease with some degree of valvular deformity. Four had a disturbance of rhythm classified as auricular fibrillation, one had a complication of diabetes mellitus and required insulin therapy, and one had a finger fracture valvulotomy on Feb. 14, 1956. The type of work is indicated, and it can be seen that this work entails physical activity of a competitive nature of varying degrees. The time involved in traveling to work ranged from 20 to 40 minutes and the distance traveled from 6 to 15 miles each way. The column on mode of travel to and from the plant shows that five of these employees drive their own cars while only two make use of a car pool.

It is also seen that in these patients the remarkable compensable rate of zero in each case is similar to that found in table 1 relating to persons with cardiac disease due to myocardial infarction. In regard to absenteeism as a result of the specific illness, only one person was absent due to a temporary decompensation. This employee was absent for 14 days and four hours and, back at work, showed a return to his previous status. The remaining six employees had no absences due to their cardiac disease.

Also listed in table 2 are the disease stability and compensation of the rheumatic group. Six of these patients are still under constant medical observation and are treated with cardiotonic drugs, as well as a low-salt diet and mercurials, to maintain their compensation. Only one patient (case 17), with aortic stenosis, does not at the time of writing require any form of medication. On the specific effect of work since employment began, two patients showed definite improvement, in that they now require less mercurials and have been able to increase their physical activity. The other five have shown no change in cardiac status.

Case 11.—A 37-year-old man had a history of rheumatic fever beginning at the age of 12. He was apparently normal until the age of 30, when he developed shortness of breath on effort, with chest pains. He has had frequent colds since childhood and had become incapacitated and unemployable at the age of 33.

Previous to his employment at Abilities, Inc., a report from Meadowbrook Hospital stated that he was hospitalized on Dec. 1, 1956, and discharged Dec. 21, 1956. His diagnosis at that time was given as pulmonary infarction and rheumatic heart disease, with enlarged heart, auricular fibrillation with bradycardia, murmur of mitral stenosis, mitral insufficiency, and Graham Steell congestive heart failure, class 4E.

The chest x-ray taken Dec. 1, 1956, revealed a heart markedly enlarged in all chambers and pulmonary consolidation in the right mid-lung field laterally. There was an increase in the left pulmonary artery pattern. His lung bases were clear, and there was no evidence of pleural fluid. Another roentgenogram taken Dec. 4, 1956, did not reveal any changes except that the possibility of pericardial effusion was considered. A third roentgenogram taken on Dec. 7, 1956, showed massive cardiac enlargement to both the right and the left. All chambers were still enlarged. There was a tremendous enlargement of the left atrium, with elevation of both main stem bronchi and marked posterior displacement of the barium-filled esophagus. A patch of density in the mid-portion of the right lung field was seen, which appeared to be parenchymal infiltration and may have represented an area of pneumonitis. No pleural fluid was noted. A fourth roentgenogram taken Dec. 12, 1956, showed no change except for some blunting of the right costophrenic sulcus.

The report on an electrocardiogram taken Dec. 1, 1956, was as follows: auricular fibrillation, prolonged intraventricular conduction, and right ventricular preponderance with possible hypertrophy. Electrocardiograms done on Dec. 10 and Dec. 20, 1956, showed no change from the previous tracing.

The patient's therapy during that hospitalization included rest, intramuscular injections of 2 cc. of meralluride daily, 0.25 mg. of digoxin given twice daily, and 500,000 units of penicillin given orally daily.

This man was hired in spite of his rather advanced rheumatic heart disease and was placed on a job of inspection, which required several hours of slow walking daily. He was examined in October, 1957, after working for six months. The cardiac findings were as follows: The heart was enlarged to the sixth interspace and to the left anterior axillary line. A moderate diastolic thrill was felt in the fifth interspace at the midclavicular line. A slight precordial heave during systole was noted in the third left interspace. On auscultation, a slapping first sound was present at the apex, while the second sound was soft and barely audible. A grade 1, blowing, soft, apical systolic murmur and a grade 3 harsh diastolic murmur with radiation to the left axilla was heard. The pulmonic second sound was accentuated and louder than the aortic second sound. Auricular fibrillation at the rate of 68 beats per minute was present. No Graham Steell murmur was audible.

Examination of the lungs showed the chest to be barrel-shaped, with hyperresonance on percussion over both lung fields outside of the cardiac area. Breath sounds were distant and equal, but persistent inspiratory and expiratory sibilance over both upper lobes was heard. The liver and spleen were not palpable; no dependent edema was present. Chest x-ray revealed marked cardiac enlargement in all directions, with some perihilar congestion. The diaphragms were flattened, and the costophrenic angles were clear. The electrocardiogram showed right ventricular hypertrophy, auricular fibrillation, and digitalis effect. The erythrocyte sedimentation rate was normal, and the complete blood cell and differential counts were normal. The employee is at present on therapy with digoxin, 0.25 mg. daily, meralluride, 2 cc. given intramuscularly once weekly, chlorothiazide, 500 mg. daily, and prophylactic doses of penicillin, 200,000 units daily given orally.

On Feb. 13, 1958, this employee caught a cold with a severe cough which responded well to chlortetracycline (Aureomycin) hydrochloride, 250 mg. given four times daily. He was out of work for two days. No change in his cardiac status occurred.

The employee has performed well while at work. He drives himself to and from work by automobile through city traffic. Absenteeism due to his cardiac status has not occurred. The employee states that since his employment he can walk greater distances than previously and suffers less breathlessness on effort.

Case 12.—A 24-year-old man was employed in September, 1957, and given a job as office boy, requiring walking and sitting. His history of rheumatic fever began in 1940; a second attack occurred in 1947, and at that time a heart condition was found. In 1955, he developed a cough and fever, hemoptysis, and auricular fibrillation. He was hospitalized at Montefiore and King's County hospitals in New

York and Brooklyn, N. Y. He developed a persistent hoarseness in 1955. His present medical regimen consists of prophylactic penicillin therapy; digitalis; theophylline, ephedrine, hydrochloride, and phenobarbital tablets (Tedrol); phenobarbitol; and a low-salt diet. At the present time, he does not complain of any breathlessness or cough.

Examination revealed a tall, thin young man with no cyanosis and no dyspnea. He had marked hoarseness, no neck vein pulsation, and no filling of neck veins on liver pressure. His blood pressure was 134/0 mm. Hg. The heart was percussed to the left mid-axillary line in the sixth interspace and to the right parasternal line. There was a suggestive systolic thrill in upper midsternum area and a slight heave at the left third interspace on systole. The heart sounds were completely irregular. The pulmonic second sound was accentuated, and there was a grade 3 apical systolic blowing murmur and a grade 2 diastolic murmur heard best over Erb's point with radiation to the neck. The first aortic sound was inaudible. The lungs were resonant to percussion. The breath sounds were altered by some harshness of the expiratory note over the lung bases and some sibilance. The liver and spleen were not palpable.

The diagnosis was rheumatic heart disease, auricular fibrillation, mitral insufficiency, mitral stenosis, and aortic insufficiency with decompensation. The patient was classed 3B. The left recurrent laryngeal nerve was paralyzed due to pressure from the enlarged heart.

Laboratory findings on Feb. 10, 1958, were as follows: red blood cells, 4,100,000 per cubic millimeter; white blood cells, 7,300 per cubic millimeter, with polymorphonuclear cells, 71%, and lymphocytes, 29%; and hemoglobin level, 12.5 Gm. per 100 cc. Urinalysis revealed the specific gravity to be 1.008; tests for albumin, sugar, and acetone were negative; and the urine was normal on microscopic examination.

The electrocardiogram showed right ventricular hypertrophy and auricular fibrillation, and x-ray of the heart revealed all heart chambers to be enlarged (cor bovinum). At reexamination on Feb. 26, 1958, there was no change in these findings.

Although this employee had a badly damaged heart, he has maintained compensation after several months of productive active work, including traveling to and from his job. He has been absent four days, without compensation.

Case 15.—A 55-year-old woman was employed on May 14, 1956, and given a sitting job at a bench. She previously had been employed as a switchboard operator. She gave a history of "rheumatism," beginning at the age of 29, and was told that she had heart trouble at the age of 54. This history was inadequate because the employee denied any cardiac examination for many years. At the time of writing, she had been on digitalis therapy for 10 months. Since being employed at Abilities, Inc., she has been fairly well and no longer complains of breathlessness on effort. Ankle edema, present when she was hired, is no longer evident. She developed diabetes mellitus in 1956; this has been controlled by diet and injections of protamine zinc insulin 12 units daily.

Examination showed no dyspnea and no cyanosis. Her blood pressure was 120/80 mm. Hg. Heart percussion showed enlargement to the left 2 sonometers outside the midclavicular line in the fifth interspace. No thrills were palpable. Heart sounds were distant. There was an apical, grade 1 systolic murmur and no radiation. The lungs were clear to percussion and auscultation. Examination of the abdomen revealed no masses; the liver and spleen were not palpable; and there was no dependent edema.

The patient was given a classification of rheumatic heart disease with mitral insufficiency, auricular fibrillation, and digitalization and was categorized in class 2B.

An electrocardiogram taken on Feb. 26, 1958, revealed right ventricular hypertrophy with vertical heart, digitalis effect, and auricular fibrillation. A chest roentgenogram taken on Jan. 16, 1958, showed that the thoracic cage was normal and lung fields clear. The left cardiac border was straightened, but the heart did not appear enlarged. A complete blood cell count done Feb. 7, 1958, gave the following findings: red blood cells, 5,060,000 per cubic millimeter; white blood cells, 8,900 per cubic millimeter, with polymorphonuclear cells, 56%, and lymphocytes, 44%; and hemoglobin level, 14 Gm. per 100 cc. Urinalysis on that date showed the specific gravity to be 1.022; tests for albumin and acetone were negative; the glucose findings was 2.4% (3+); and results of the microscopic examination were normal.

Hypertensive Heart Disease

In this study, there were only two employees with hypertensive heart disease. One, a 62-year-old woman, had auricular fibrillation. In addition, a nodule, about the size of a small pea, was present in the left upper lobe of the thyroid gland. The other employee, a 54-year-old woman, had angina on effort and required 30 tablets of glyceryl trinitrate a day. She also had complicating diabetes mellitus which required 40 units of protamine zinc insulin given daily. In neither case was there overt evidence of congestive failure. Their type of work does not require too great a physical effort. One does coil winding, a sitting job, and the other clerical work, also a sitting job. The travel time is 45 minutes for one and 60 for the other each way, and the distance traveled is 11 and 13 miles respectively. Both of these patients traveled to and from work by means of a car pool.

The starting date of employment at Abilities, Inc., was November, 1956, for the first and August, 1957, for the second. Absenteeism due to the specific illness has been zero for both. No accidents have occurred during the time employed, which is up to the time of writing for both employees.

The first patient has had no change in cardiac or hypertensive status. The second, who had angina pectoris on effort for five years previous to employment and required 30 glyceryl trinitrate tablets daily, now takes only 3 per day. This change in status of angina pectoris has taken place gradually over the past three years. There has been no change in hypertensive or diabetic state.

Comment

A report by Olshansky and associates,[7] on cardiac patients in the greater Boston area, revealed that employers are reluctant to hire such persons even if they do not have a definite policy against it. Only 99 persons known to have cardiac disease were hired among 13,431 workers during a six-month period. Kline[4] reported that the physical demand of work exceeded the physical capacity of the cardiac patient and was listed by 71% of the industrial physicians surveyed as a major reason for reluctance in hiring these persons. Next in order of importance was the risk of monetary loss arising out of compensation claims (42%); consideration that cardiac patients are a heavy burden on company-sponsored insurance programs (30%); insufficient medical staff (12%); and policy of personnel department (11%). Only 8% of the physicians surveyed considered cardiac patients to be unsafe workers, and only 3% considered them to be inefficient. Lee and associates[8] also found that the threat of monetary loss from compensation claims, sickness benefits, or pension benefits is a major reason cited by industry for reluctance to hire persons with cardiac disease. They found that 9 out of 19 industries had a stated policy to hire such persons, 7 had a definite policy against hiring them, and in 3 this information was not available. Eight industries revealed that cardiac patients had been hired during the past year, and, in this period, 242 persons known to have cardiac vascular disease were among the total of 19,321 new workers employed. Asymptomatic hypertension was the most common diagnosis, followed in order by rheumatic heart disease, heart disease, type undetermined, and arteriosclerotic heart disease. Actually, only 24 new employees had been given a diagnosis of arteriosclerotic heart disease, despite the frequency of this disease in the adult male population of the United States. All 19 industries reported, however, that it was their policy to return an employee to his job after recovery from an acute heart attack. The need for more facts regarding the work experience of cardiac patients was stressed.

Jezer[9] states that "the work experience of rheumatic cardiacs who show auricular fibrillation is very poor, and their rate of absenteeism is much higher [than cardiacs with minor arrythmias], because the arrythmia is usually associated with advanced heart disease, congestive heart failure, and, frequently, peripheral embolization."

The literature is replete with reports showing "cardiacs" to be safe workers,[10] especially when properly placed; usually they have a higher average productivity than persons without cardiac disease, and the turnover among this group is below the average for the latter group.

Frequently, the detrimental effect of the psychological and emotional stress of a patient after ill-advised activity restriction is actually greater than that due to the cardiac involvement per se.[11] Another report[12] stated that occupational activity does not necessarily lead to progression of heart disease or deterioration of the physical condition of the patient. As a matter of fact, a substantial number of patients with cardiac disease show improvement while in an employed status. This conclusion was based on a study of 580 patients with various cardiac diseases. Lee and co-workers,[8] in a questionnaire survey of general practitioners, concluded that the experience was favorable in patients returning to work after an acute myocardial infarction. Most of the patients were able to return not only to work but to their previous occupations without a great deal of restriction. It was thought that advice from the physician regarding the ability of the patient to return to work and to a useful, productive life should be included in his discussion with the patient. The elimination of fear about heart disease was thought to be the major problem faced by the general practitioner in his efforts to rehabilitate patients with cardiovascular disease.

Conclusions

This report on 19 employees, all classified as having severe or advanced heart disease, may be considered unique in that never in the history of private industry has such a deliberate policy of employing the "unemployable" cardiac patients been seen. The financial success of this enterprise is evidence of the productivity of these employees. The maintenance of excellent attendance records, and not one reported case of compensable injury, is directly contrary to the stated reasons given by industry for not employing cardiac patients. The absence of any detrimental effect of employment on the disease state is well documented in the literature, and the remarkable improvement exhibited by some of the employees makes one wonder whether the dictum that the person with severe cardiac disease requires constant rest and should retire from employment should not be revised to this: Employment in a compatible job can, in the specific case, be beneficial.

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References

1. Kline, E. M.: Aiding Cardiac Patient in Industry, A. M. A. Arch. Indust. Hyg. **3**:454-460 (May) 1951.
2. Hellerstein, H. K., and Ford, A. B.: Rehabilitation of Cardiac Patient, J. A. M. A. **164**:225-231 (May 18) 1957.
3. Laplace, L. B.: Heart Patients Can Work, Philadelphia Med. **48**:487-488 (Nov. 15) 1952.
4. Kline, E. M.: Heart Disease and Employment: Current Survey, Indust. Med. **23**:126-127 (March) 1954.
5. Black, B. J.: Rehabilitation and Readjustment of Cardiac Patient, Connecticut M. J. **20**:196-198 (March) 1956.
6. Chapman, A. L.: Program of United States Public Health Service in Heart Disease in Industry, Am. J. Cardiology **1**:361-364 (March) 1958.
7. Olshansky, S.; Friedland, S.; Clark, R. J.; and Sprague, H. B.: Survey of Employment Policies as Related to Cardiacs in Greater Boston, New England J. Med. **253**:506-510 (Sept. 22) 1955.
8. Lee, P. R.; Rusk, H. A.; White, P. D.; and Williams, B.: Cardiac Rehabilitation: Questionnaire Survey of Medical Directors in Industry, J. A. M. A. **165**:787-790 (Oct. 19) 1957.
9. Jezer, A.: Symposium on Prolonged Illness: Work Capacity of Cardiac, M. Clin. North America **37**:667-684 (May) 1953.
10. Brown, U. L.: Heart Disease in Industry, M. J. Australia **1**:236-240 (Feb. 13) 1954. Symposium on Cardiac in Industry, Elkins, W. Va., Golden Clinic, 1953, p. 135.
11. Newman, L. B.: Role of Physical Medicine and Rehabilitation in Rheumatic Heart Disease, J. A. M. A. **165**:1547-1555 (Nov. 23) 1957.
12. Staff of Work Classification Unit, Adult Cardiac Clinic, Third (New York University) Medical Division, Bellevue Hospital, New York: Effects of Employment on Course of Heart Disease, A. M. A. Arch. Indust. Hyg. **3**:367-374 (April) 1951.

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LOWER EXTREMITY SKIN COVERAGE IN CHILDREN

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Short cuts for supplying adequate skin coverage to the lower extremity in children, especially those below the age of 10, are mandatory. It is not practical to place a child in a cross-leg flap position or to attempt distant pedicle procedures. Comparison between the adult and the child can be made in practically every circumstance, from the problem of the simple small superficial coverage to that of the larger deep areas.

In an extensive burn in an adult, when the postage stamp skin graft method is used, there is good healing of the grafts; however, the grafts are placed closer together in the adult in order to get quicker epithelization between them. The scarring between the postage stamp grafts is more evident in the adult. It may take months before the dark blue color between the postage stamp grafts will disappear, because of poor circulation. It is also necessary to support circulation of the entire lower extremity with elastic bandages for many months. In the child, a more complete coalescence of postage stamps with sturdier epithelium takes place, and new superficial venous channels spring up in a relatively short time. Little of the multiple-square appearance that shows up in the adult postage stamp grafting is evident in the child.

In the adult, tendon exposure for any length of time means almost certain death to the tendon unless a flap or tube pedicle can be applied for coverage. This requires many stages and extensive casting, which is almost impossible in children below the age of 10. In a child, when tendon exposure occurs there will often develop a granulation tissue covering from the surrounding areas within 10 to 14 days. This is less time than it would take to prepare an abdominal-pedicle or a cross-leg flap. This granulation bed will take an adequate skin graft, which after several months develops an areolar layer of tissue and a satisfactory pliable coverage.

This was the situation in a child who had suffered a severe crush injury (fig. 1). Split thickness skin grafts were used to cover the granulation tissue as soon as the tendons were covered. Multiple drill holes were placed in the small area of exposed bone at the time of split grafting. The grafts took completely. Within two weeks granulation tissue grew out of the drilled bone, and this smaller area healed spontaneously.

In the child with an extensive burn, a more complete coalescence of postage stamp grafts, with sturdier epithelium, takes place, and new superficial venous channels spring up in a relatively short time. When tendon exposure occurs there will often develop a granulation tissue covering from the surrounding areas within 10 to 14 days. This is less time than it would take to prepare an abdominal-pedicle or a cross-leg flap. Long-standing immobilization of a joint of a child or exposure of the joint of a child are not the major problems that they are in the adult. Comparison between the adult and the child, from the problem of the simple small superficial coverage to that of the larger deep areas, can be made in practically every circumstance.

In the adult, exposure of the Achilles tendon, with loss of surface coverage, requires a full-thickness skin flap with subcutaneous tissue. The cross-leg type flap is used to get satisfactory coverage and function. In children, exposure of the Achilles tendon is not as alarming a problem (fig. 2). These wounds first require a good surgical débridement. This is sometimes followed by the use of enzymatic débridement agents to hasten cleaning of the wound. It may take several days with daily applications to help débride remaining areas that could not be cleaned surgically. A single thickness of fine mesh gauze, which need be changed only once a day, should be used over the wound. (This is used to prevent pain when the dressing is changed and also to help keep granulations flat.) Above this, warm saline dressings should be applied every three hours during the day and every four hours during the night. When a good clean granulation coverage has been obtained, a split skin graft is then used. A pliable areolar layer develops under the split-thickness skin graft, and the Achilles tendon then functions satisfactorily. No further coverage is ordinarily necessary. If lengthening of the Achilles tendon is necessary at a later age due to hindered growth, then a cross-leg flap can be done at the more opportune age.

In the adult, tibial exposure with chronic ulceration almost always requires an abdominal-tube pedicle or cross-leg flap coverage in the event a

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Read before the Meeting of American Society of Plastic and Reconstructive Surgery, Nov. 5, 1957, San Francisco.

bone graft is necessary. In children, tibial exposure is usually not serious. Most bone exposures will cover with granulation tissue. The use of multiple drill holes in the cancellous bone is reserved to promote granulations for earlier grafting in wider areas of exposure. Usually this coverage can be obtained within a two-or-three-week period by split skin grafts. There has never been a case of post-traumatic nonunion in the tibia of a normal baby or young child in the Milwaukee Children's Hospital.

In the adult, exposure of the calcaneus by a cast pressure sore may be as major a problem as the original injury for which the leg was placed in a cast The area may require the placement of a cross-leg flap for adequate coverage. In children the calcaneus exposures do occur from time to time in legs which have been in casts for long periods of time (especially those which may have had femur fractures with traction). Here again, multiple holes can be drilled into the bone After adequate necrotic tissue débridement and wet dressings, a clean granulation tissue covering will form in two to three weeks. A split graft at this stage will adequately handle the problem.

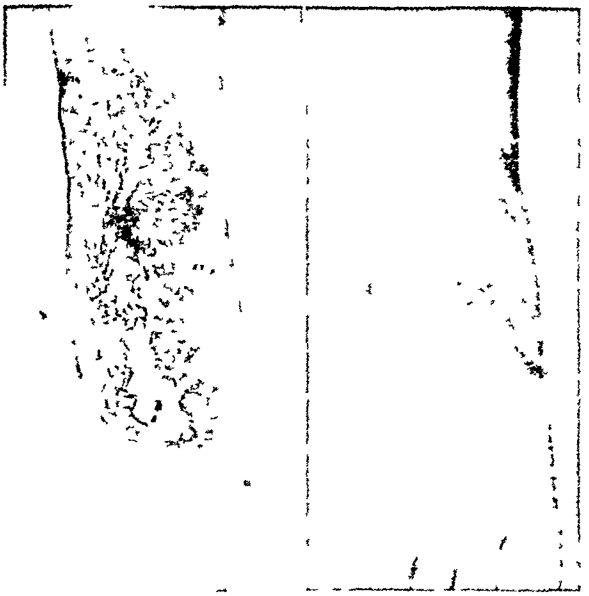

Fig 1 —*Left*, debridement after crush injury of dorsum of foot. Demonstrates mechanism of granulations over tendons to give protective coverage in child *Right*, adequate skin cover, in same child, provided by split skin grafting directly over granulations covering tendons Areolar layer develops in six or more months for adequate gliding.

In the adult, joint exposures usually mean permanent stiffness with extreme inadequacy of the joint. It may even be serious enough so that arthrodesis or arthroplasty may be required later. In children an open joint will seal and heal almost miraculously, many times without apparent damage to its mobility.

In a severe acute injury with tissue loss and [illegible] tendon, and nerve exposure in the adult, the surgeon must be cautious in using local primary rotation flaps for coverage of vital structures below the knee. The chances of poor flap circulation without the use of delay procedures are increased lower on the leg Consequently, all one can do initially is to resort to split skin grafts for avulsed areas and the utilization of the safer double-pedicle flap as much as possible. The more extensive rotation flaps may be used as possible secondary procedures in the adult.

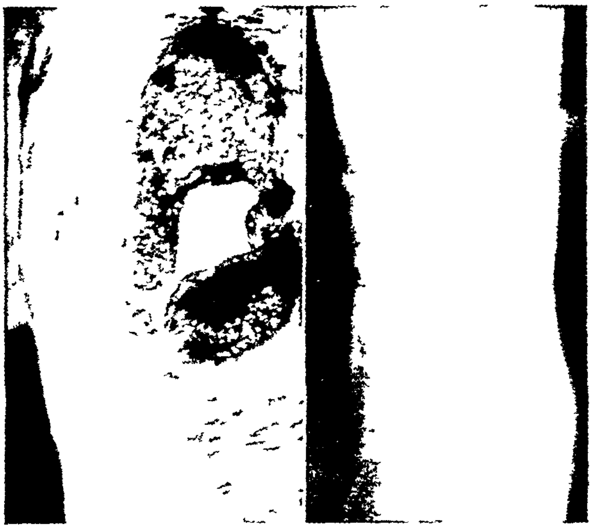

Fig 2 —*Left*, granulation tissue, in child, creeping over exposed Achilles tendon and portion of calcaneus *Right*, split skin graft coverage, in same child, adequate over granulations which had completely covered Achilles tendon and calcaneus Areolar tissue developed under split skin graft for adequate skin mobility above tendon

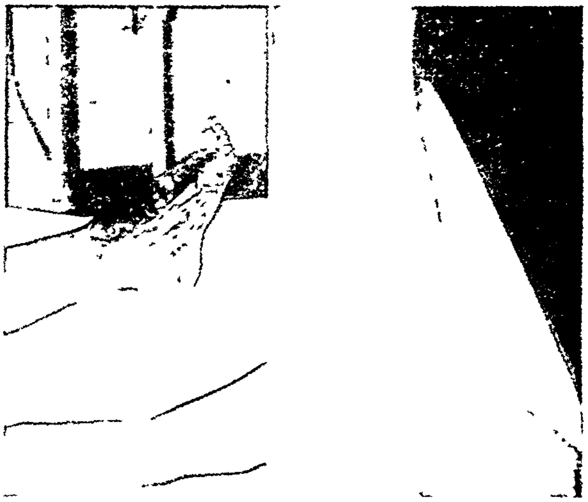

Fig 3 —*Left*, avulsion of skin dorsum of foot of child with exposure of tendons, nerve, and bone Considerable amount of dirt and black grease in wound *Right*, foot of same child after healing effected by thorough wound cleansing and primary rotation flaps to cover tendon, nerve, and bone, with adjacent split skin grafting.

n injury in the child, much can be initial use of primary rotation flaps, foot, with relative safety. When there re of bone and tendons, if the patients are d early, many hours of time and repetitious surgery can be saved. This is illustrated in the case of a child whose foot was run over by a car and in whom there was avulsion of the skin exposing tendon, nerve, and bone (fig. 3). Rotation flaps were immediately used, after thorough wound cleansing, to cover tendon and bone. Split skin was used to cover the areas from which these flaps were taken. Thus, primary healing was effected with good function, saving many additional weeks of hospitalization. This same procedure could not have been successfully consummated in the adult.

Conclusions

A primary well-healed wound of the lower extremity with adequate skin coverage is much easier to obtain in the child than in the adult. Coverage in most children can be effected, at least temporarily, with use of free grafts and local flaps without the use of distant flaps. Long-standing immobilization of a joint of a child or exposure of the joint of a child are not the major problems that they are in the adult. Inherent healing facility, basic circulation, and the elastic mobility of the skin in the child is better. Exposure of bone in the lower extremity in the child does not usually cause major difficulties.

536 W. Wisconsin Ave. (3).

SERUM GLUTAMIC OXALACETIC TRANSAMINASE ACTIVITY IN ACUTE AND CHRONIC ALCOHOLISM

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and
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Eighty per cent of chronic alcoholics exhibited a significant and characteristic rise in the SGO-T activity after acute alcohol intoxication without alteration in the results of the other tests of liver function. There was a rough correlation between the blood alcohol concentration and the SGO-T activity. None of the healthy volunteers developed increased SGO-T activity after ingestion of large amounts of alcohol. The ingestion of alcohol in the chronic alcoholic may lead to cellular damage that may become irreversible after a period of time, with subsequent replacement of liver parenchyma with fibrous tissue and the development of Laennec's cirrhosis.

The purpose of this paper is to present studies of serum glutamic oxalacetic transaminase (SGO-T) activity before, during, and after heavy alcohol ingestion and to correlate the changes in enzyme activity with blood alcohol level, icteric index, thymol turbidity, and serum protein levels as determined by paper electrophoresis.

A pilot study demonstrated normal SGO-T levels in hospitalized chronic alcoholics not having access to alcohol. In one patient the SGO-T activity was followed at close intervals within the first few days after he had consumed large amounts of alcohol. A striking increase of the SGO-T activity was found within the first 24 hours after the alcohol intake, while the icteric index, alkaline phosphatase level, thymol turbidity, and serum protein levels remained within normal limits.

The SGO-T activity is greatly increased in viral hepatitis but may be normal or slightly elevated in cirrhosis of the liver.[1] Experimental carbon tetrachloride poisoning in rats [1a] and virus hepatitis in mice [2] are followed by striking increases in SGO-T activity which are relatively proportional to the degree of cell damage observed at autopsy. These data suggest that the mechanism of elevation of the SGO-T activity is a release of large amounts of enzyme through the damaged liver cells, but alterations of the rate of destruction and excretion of the enzyme through the damaged liver may also to a certain extent account for the increased SGO-T level. Further experimental data are needed to elucidate this problem.

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Chronic alcoholism has been considered by many investigators to be an important contributory factor in the development of Laennec's cirrhosis, but little is known about the exact pathogenesis. Clinical observations have suggested and experimental data have demonstrated a hepatotoxic effect of alcohol which, however, can be accelerated or prevented by dietary measures.[3] The diet of the socially deranged alcoholic is usually low in protein and supposedly deficient in the so-called lipotrophic factors, such as methionine and choline. According to the prevalent theory, a relative deficiency in lipotrophic liver-protective agents may be an important pathogenic factor in the development of the alcoholic cirrhosis. Treatment of cirrhosis with these substances, however, has been without demonstrable effect.[4]

Seventy-five per cent of alcoholic patients have been shown at autopsy to have fatty livers, but only 9% had Laennec's cirrhosis.[5] This and experimental observations [6] have led to the thought that the fatty liver (steatosis) probably represents a precirrhotic stage. Punch biopsies of fatty livers before and after adequate diet was given and alcohol withdrawn have shown that steatosis of the liver is a reversible process.[7] Fatty liver in the alcoholic does not usually give rise to symptoms, and findings on liver function studies are almost always within normal limits.

Material and Methods

Thirty-nine chronic alcoholic subjects, aged 27-78 years, who had all been heavy drinkers for 10 years or more, were admitted to the hospital whenever it was obvious that they were acutely intoxicated. The majority of these patients had been under psychiatric treatment in the clinic for several months to several years and were supposed to be taking disulfiram (Antabuse). At the time of admission none showed evidence of a disulfiram-alcohol reaction. Punch biopsies of the liver were done in three of these patients.

A control series consisted of 19 patients who were inmates at a closed municipal institution for the treatment of chronic alcoholism. These patients were on management with disulfiram and had not taken alcohol for months. An additional control series of 12 healthy individuals (medical personnel) whose alcohol consumption was minimal were given 200 cc. of aquavit (45% alcohol).

Blood was withdrawn from the alcoholic patients immediately on admission (1 to 10 hours after the consumption of alcohol) for determination of blood alcohol levels, thymol turbidity, icteric index, serum protein levels (by paper electrophoresis), and SGO-T activity. These tests were repeated once or twice daily while the patients were in the hospital. The same procedures were followed with the control groups.

The SGO-T activities were determined spectrophotometrically by the method described by Henley and Pollard.[8] Our upper limit of normal of SGO-T level, as determined by this method, has been 2 mM. of pyruvic acid per milliliter of serum per hour. One millimole of pyruvic acid per milliliter per hour corresponds to 20 spectrophotometric units.[9] Four units is considered to be the upper limit of normal, for the thymol turbidity test. Icteric index determinations were done by the Meulengracht method, and values of more than 7 units were considered pathological. Widmark's method was used for blood alcohol assays, and the results were given as the average of three determinations. In our laboratory the ranges of normal for paper electrophoretic determinations are as follows: albumin, 4.17-4.89 Gm. per 100 cc.; globulin, 2.0-3.17; and globulin fractions: alpha$_1$, 0.27-0.41; alpha$_2$, 0.45-0.63; beta, 0.65-1.05; and gamma, 0.65-1.08.

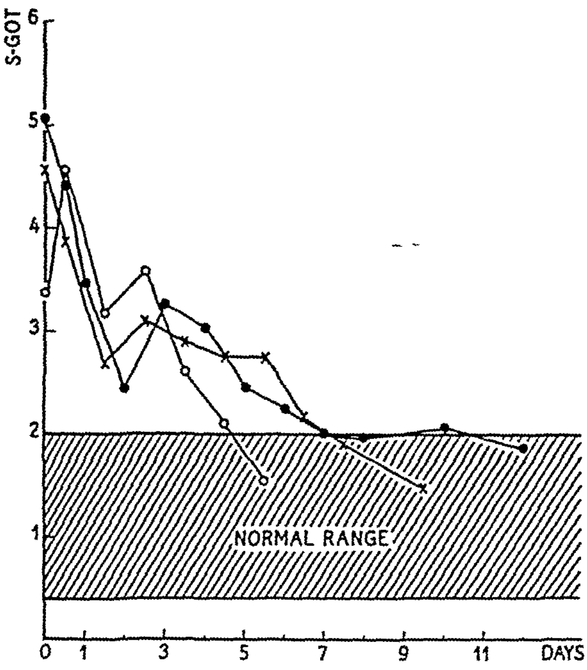

Fig. 1.—Serum glutamic oxalacetic transaminase activity after acute alcohol intoxication in three chronic alcoholics.

Results

Four patients were excluded from the alcoholic group because the results of liver function tests showed signs of "active cirrhosis" and the SGO-T showed considerable spontaneous variation. Eight patients showed normal SGO-T activities on repeated determinations. The remaining 27 patients showed elevated SGO-T activities 1 to 11 days after the acute alcohol intoxication varying between 2.18 and 10.85 mM. per milliliter per hour. The average maximum SGO-T activity of these patients was 4.1 mM. per milliliter per hour, present on the initial blood sample. Occasionally, a further rise was observed during the first 48 hours after admission; normal values were usually encountered after three to five days. The shortest time the SGO-T level was observed to be elevated was 24 hours, and elevated activities were found as late as 11 days after admission. Figure 1 shows three typical tracings for SGO-T activity.

Eighteen patients were under observation in the hospital until normal SGO-T activities were obtained, but during their two-to-seven-day hospitalization "typical" SGO-T curves were obtained in all. Thymol turbidity and icteric index were normal on repeated determinations in the entire group of 35 alcoholics. The gamma globulin level, as determined by paper electrophoresis, was never found elevated; conversely, the serum globulin and particularly the gamma globulin values were frequently found lower than normal for our laboratory.

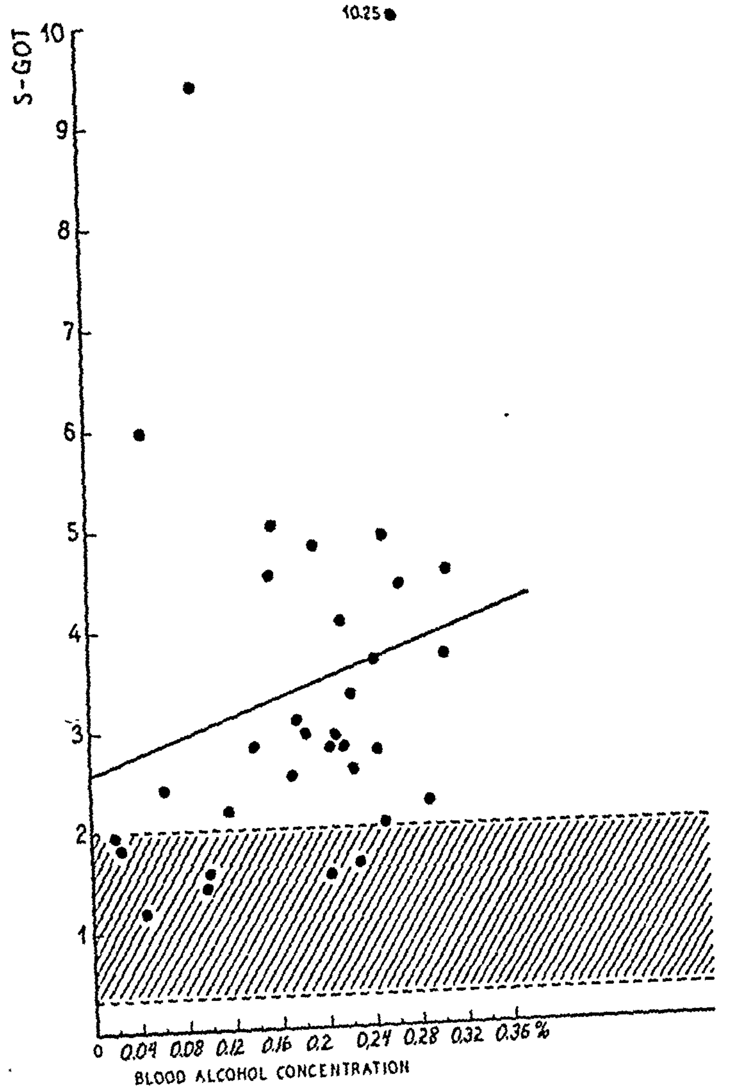

Fig. 2.—Relationship between blood alcohol concentration on admission and maximum serum glutamic oxalacetic transaminase levels in 33 chronic alcoholics. Solid line is average maximum level.

Liver biopsies were performed on three patients who showed typical SGO-T level elevations. In two cases, slight fatty infiltration was found, while in the third the biopsy was entirely normal.

The blood alcohol concentration in the 27 patients who had increased SGO-T activities after the acute alcohol intoxication averaged 0.204% (range, 0.049% and 0.308%). The eight patients who had normal SGO-T values had an average blood alcohol concentration of 0.113%, varying between 0.025% and 0.223%. A rough correlation was found between the blood alcohol concentration encountered immediately after admission and the maximum SGO-T activity (fig. 2). It must be borne in mind that the blood alcohol concentration found on admission did not always represent the maximum, as the patients were admitted at different time intervals after the alcohol intake.

In order to ascertain the direct relationship between the alcohol intake and the rise in the SGO-T activity, the SGO-T activity was followed at close intervals in a 49-year-old man after alcohol administration on two occasions during the hospital stay (fig. 3). The first spike of the tracing represents the rise in SGO-T activity after admission. The blood alcohol concentration was 0.158%. Two weeks later the patient was given 225 cc. of aquavit (alcohol content, 100 Gm.), after which his blood alcohol concentration rose to 0.178%. A typical rise in the transaminase activity was observed in the serum, and normal values were found again after 48 hours. In another "alcohol tolerance test," after 300 cc. of aquavit (135 Gm. of alcohol) was given the blood alcohol concentration was 0.216% and the SGO-T activity was found to be more elevated this time than it was after the first test.

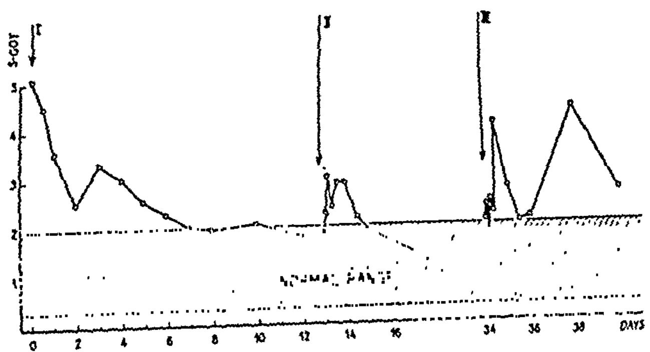

Fig. 3.—Serum glutamic oxalacetic transaminase activity in a 49-year-old chronic alcoholic: I, on admission, blood alcohol concentration 0.158 %; II, first alcohol tolerance test: 100 Gm. of alcohol given, blood alcohol concentration 0.178 %; III, second alcohol tolerance test: 135 Gm. of alcohol given, blood alcohol concentration 0.216 %.

In another patient we had the opportunity to follow the SGO-T activity after two episodes of acute alcohol intoxication. Figure 4 shows the moderate rise in SGO-T activity after the first bout. The patient insisted on leaving the hospital after 24 hours, but 6 hours later he was readmitted in a state of severe intoxication. During the following days a considerable rise in the SGO-T activity, with a peak on the fifth day, was observed. At the time of the first admission, the blood alcohol concentration was 0.114%; on the second admission it was 0.049%. The marked and prolonged rise in SGO-T activity after the second episode, when only a moderate blood alcohol level was encountered, could be the result of a continuing insult to a liver that had not fully recovered from the prior intoxication.

Control Series.—The control series comprised 19 chronic alcoholics, inmates of a municipal institution for the treatment of chronic alcoholism, and 12 healthy volunteers. In the inmates the liver function tests (thymol turbidity, icteric index, and paper electrophoretic determinations) were normal. Eighteen of these patients showed normal SGO-T values; in one patient a slight elevation was found on the first determination (2.19 mM. per milliliter per hour), but normal values were encountered on subsequent determinations.

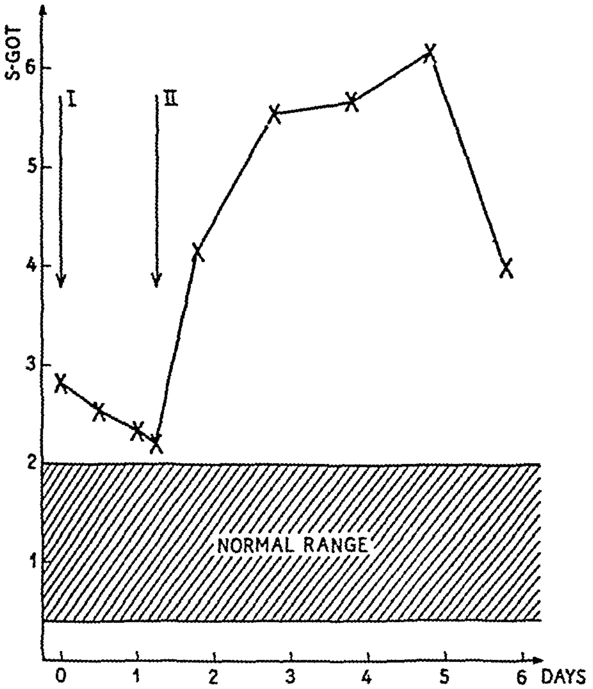

Fig. 4.—Serum glutamic oxalacetic transaminase activity in a 32-year-old chronic alcoholic after two admissions in acute intoxication: I, blood alcohol concentration 0.141%; II, blood alcohol concentration 0.049 %.

The SGO-T activity and the liver function tests in 12 healthy nonalcoholic individuals after the administration of liberal amounts of alcohol remained within normal limits. The average blood alcohol level was 0.136%, varying between 0.098 and 0.197% as compared to 0.204 and 0.113% for the alcoholic groups.

Comment

None of the chronic alcoholics in this series had clinical or biochemical evidence of hepatic disease, but 80% exhibited a significant and characteristic rise in the SGO-T activity after acute alcohol intoxication without alteration in the results of the other tests of liver function. Furthermore, there was a rough correlation between the blood alcohol concentration and the SGO-T activity. These data suggest that in this group of alcoholics the ingestion of alcohol resulted in acute liver cell damage and confirm the prior experimental evidence and clinical observations of a direct hepatotoxic effect of alcohol when administered after long periods of inadequate diet. Whether this was the result of latent, indetectable liver disease (fatty infiltration of the liver) or of deficiency of dietary substances ordinarily protecting liver cells from the effects of alcohol cannot be ascertained on the basis of our present data.

In two of three patients for whom liver biopsies were done fatty infiltration of the liver was found; in the third the liver was found to be normal. All three patients had significant increases of SGO-T activity of the same magnitude after alcohol intake, suggesting that fatty liver, per se, does not give rise to increased SGO-T activity.

The fact that the rise in SGO-T activity could be reproduced twice in a chronic alcoholic by administration of alcohol after two weeks and five weeks of adequate varied hospital diet and withdrawal of alcohol suggests the presence of subliminal liver disease as a major factor in the release of transaminase from normal liver cells as a direct reaction to the ingestion of alcohol. A final evaluation of the role of the diet cannot be given on the basis of this single observation. To clarify this further, a series of chronic alcoholics are at present being maintained on a nutritious, high-calorie, high-protein diet with massive vitamin supplements, and studies of changes in the SGO-T activity after ingestion of alcohol are being carried out at four-to-six-week intervals.

None of the healthy volunteers developed increased SGO-T activity after ingestion of large amounts of alcohol. Although their blood alcohol concentration was somewhat less than in the alcoholic group with increased SGO-T activity, this latter observation indicated that increased concentration of alcohol in the blood or metabolites does not alter the indicator system for transaminase assay ($DPNH_2 \rightleftharpoons DPN$) so as to give rise to false-positive results.

It is felt that the above data may indicate that the ingestion of alcohol in the chronic alcoholic will lead to cellular damage that may become irreversible after a period of time, with subsequent replacement of liver parenchyma with fibrous tissue and the development of Laennec's cirrhosis.

Summary

Serum glutamic oxalacetic transaminase (SGO-T) activity increased in 27 of 35 patients with chronic alcoholism after acute alcohol intoxication, while thymol turbidity, the icteric index, and the serum protein levels, as determined by paper electrophoresis, remained within normal limits.

The SGO-T activity remained elevated for from two hours to 11 days after the alcohol intake but, on the average, fell to normal by the fourth day. A rough correlation was found to exist between the blood alcohol concentrations and the maximum SGO-T activities.

The rise in transaminase activity could be reproduced in the chronic alcoholic by the administration of alcohol at a time when the patient was maintained on a varied, sufficient hospital diet for five weeks. The SGO-T activities remained within normal limits for two weeks in 19 chronic alcoholics who had no access to alcohol. The SGO-T activities remained within normal limits also in 12 healthy, nonalcoholic individuals after the administration of large amounts of alcohol. These observations may indicate that alcohol has a direct hepatotoxic action on the liver of the chronic alcoholic.

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Frank Lundquist, Ph.D., of the Institute of Forensic Medicine, Copenhagen, did the blood alcohol assays.

References

1. (*a*) Wróblewski, F., and LaDue, J. S.: Serum Glutamic Oxalacetic Aminopherase (Transaminase) in Hepatitis, J. A. M. A. **160:**1130-1134 (March 31) 1956. (*b*) De Ritis, F.; Coltorti, M.; and Giusti, G.: Attivita transaminasica del siero umano nell 'epatite virale: Nota preventiva, Minerva med. **2:**1207-1209 (April 28) 1955. (*c*) Madsen, S.; Bang, N. U.; and Iversen, K.: Glutaminsyre-oxaleddikesyre-transaminase i serum ved lever-og galdevejssygdommer. Nord. med. **58:**1008-1013 (July 11) 1957. (*d*) Molander, D. W.; Wróblewski, F.; and LaDue, J. S.: Serum Glutamic Oxalacetic Transaminase as Index of Hepatocellular Integrity, J. Lab. & Clin. Med. **46:**831-839 (Dec.) 1955.

2. De Ritis, F.; Coltorti, M.; and Giusti, G.: Serum and Liver Transaminase Activities in Experimental Virus Hepatitis in Mice, Science **124:**32 (July 6) 1956. Friend, C.; Wróblewski, F.; and LaDue, J. S.: Glutamic-Oxaloacetic Transaminase Activity of Serum in Mice with Viral Hepatitis, J. Exper. Med. **102:**699-704 (Dec.) 1955.

3. Lillie, R. D., and others: Histogenesis and Repair of Hepatic Cirrhosis in Rats Produced on Low Protein Diets and Preventable with Choline, Pub. Health Rep. **57:**502-508 (April 3) 1942. Lowry, J. V., and others: Treatment of Dietary Liver Cirrhosis in Rats with Choline and Casein, ibid. **56:**2216-2219 (Nov. 14) 1941. Lowry, J. V.; Ashburn, L. L.; Daft, F. S.; and Sebrell, W. H.: Effect of Alcohol in Experimental Liver Cirrhosis, Quart. J. Stud. Alcohol **3:**168-175 (Sept.) 1942. Patek, A. J., Jr., and Post, J.: Treatment of Cirrhosis of Liver by Nutritious Diet and Supplements Rich in Vitamin B Complex, J. Clin. Invest. **20:**481-505 (Sept.) 1941. Summerskill, W. H. J.; Wolfe, S. J.; and Davidson, C. S.: Response to Alcohol in Chronic Alcoholics with Liver Disease: Clinical, Pathological, and Metabolic Changes, Lancet **1:**335-340 (Feb. 16) 1957.

4. Phillips, G. B., and Davidson, C. S.: Nutritional Aspects of Cirrhosis in Alcoholism—Effect of Purified Diet Supplemented with Choline, Ann. New York Acad. Sc. **57:**812-830 (May 10) 1954.

5. Jolliffe, N., and Jellinek, E. M.: Vitamin Deficiencies and Liver Cirrhosis in Alcoholism: Cirrhosis of Liver, Quart. J. Stud. Alcohol **2:**544-583 (Dec.) 1941.

6. Chaikoff, I. L.; Connor, C. L.; and Biskind, G. R.: Fatty Infiltration and Cirrhosis of Liver in Depancreatized Dogs Maintained with Insulin, Am. J. Path **14:**101-110 (Jan.) 1938.

7. Iversen, P., and Krarup, N. B.: Steatosis Hepatitis Treated with Vitamin B_1: Examination with Liver Biopsy, Acta med. scandinav. **105:**441-446, 1940.

8. Henley, K. S., and Pollard, H. M.: New Method for Determination of Glutamic Oxalacetic and Glutamic Pyruvic Transaminase in Plasma, J. Lab. & Clin. Med. **46:**785-789 (Nov.) 1955.

9. Karmen, A.: Note on Spectrophotometric Assay of Glutamic-Oxalacetic Transaminase in Human Blood Serum, J. Clin. Invest. **34:**131-133 (Jan.) 1955.

POCKET NEBULIZERS IN TREATMENT OF ASTHMA.—The psychologic component in cases of bronchial asthma is often referred to in medical literature. In most instances, it is highly exaggerated. However, it is often clearly evident in cases of chronic asthma in which repeated attacks of suffocation have occurred. In such cases, the patients live in a state of apprehension, always in fear of another attack. The mere presence of a nebulizer containing an appropriate medicament, which from experience they know will give them almost instant relief, may help restore their equanimity and give them the sense of security they so sorely need. The practice of allowing pocket nebulizers and the medicament to be used in them to be sold over the counter by druggists is a distressing matter. Their use definitely should be limited to the prescription by a physician who has examined his patient and feels that it would be helpful for the patient to have this therapeutic device. In many cases it may not be necessary. . . . The use of pocket nebulizers with sympathomimetic drugs for the treatment of acute attacks of asthma is efficient and generally reliable. There is no toxicity with their use, and they have few, if any, side effects. If the use of a pocket nebulizer is properly explained to a patient, it does not deter the patient from seeking investigation of the cause of the attacks and thereby securing specific and more lasting therapy. Too frequent use of pocket nebulizers can be obviated by prescribing a nebulizer which administers a measured standard dose, and by specifying to the patient under what conditions the nebulizer should be used.—M. C. Harris, Use and Abuse of Pocket Nebulizers in Treatment of Asthma, *Postgraduate Medicine,* February, 1958.

WHAT IS "THE CAUSE OF DEATH"?

Carl L. Erhardt, New York

The primary or underlying cause of death is defined as that condition or injury (or circumstances of the injury) that initiated the train of morbid events leading directly to death. The question sometimes arises as to which of several existing conditions has caused death. The clinician may logically say that none of the diseases singly, in a specific patient, caused death, but rather the complex of conditions. Only the physician in attendance can judge adequately which of several conditions was the most important factor in the death of the patient; yet improper completion of about 80,000 death certificates a year requires that nosologists in vital statistics offices interpret the physician's meaning. Whether the traditional concept of a single cause of death is adequate to current needs is an elemental question that would generate wide serious discussion. The major users of information on death certificates are research clinicians, pathologists, and physicians, not only those in public health but also practicing physicians with special interests. The attending physician, therefore, in completing the death certificate, is fundamentally transmitting information to his colleagues. His respect for them should be adequate incentive to do the job right. The physician must be influenced to change his attitude that the death certificate is "just paper work," that its completion is a last rite for someone no longer of clinical interest, and that it represents merely another bit of bureaucratic red tape.

Few physicians are familiar with the processing of death certificates in a vital statistics office to produce mortality statistics. This lack of knowledge is reflected in the often inaccurate use of such statistics, without due regard for such influences as certification habits of physicians, the concept of a single cause of death, management of nosology problems, and the classification system used. These influences have particular import in mortality from diabetes with its current high frequency of cardiac and vascular complications that may be certified as either underlying or contributory causes of death. It seems profitable, therefore, to review some of these factors to assess their part in determining the meaning of mortality statistics.

The process starts with the recording of the cause of death by the attending physician, and it is a truism that mortality statistics can reflect no more than what he reports. If we assume for the moment that the physician has thoughtfully and clearly recorded his best clinical judgment regarding the conditions that led to death and any significant pathology contributing, what then comes out in the statistics, how does it get there, and why are some manipulations necessary at times? What efforts have been, or are being, made to improve the process and the data?

Classification of Diseases

To be digestible, any mass of data must be summarized in a regular manner. Causes of death must likewise be grouped in some way to permit a view of the forest apart from the confusion of trees. The purpose of a classification of diseases is to accomplish this summarization for analytic purposes. A disease entity appears as a separate item in a classification if it is numerically frequent, if it is especially serious, or, perhaps, if it has peculiar interest for medical research. Otherwise, similar conditions are grouped. The groupings may be assembled in a number of ways: pathologically, etiologically, anatomically, or on other axes. In practice, the schema used for causes of death is a compromise between a number of such axes: etiology, anatomy, circumstances of onset, and the like.

Nomenclature of Diseases.—Much confusion exists regarding the distinction between a nomenclature and a classification, and it is important to distinguish between them at the outset.[1] As indicated previously, a classification summarizes for analytic purposes. Every disease entity, condition, or state must have a "home"—a category in which it belongs, sometimes alone, sometimes with other related conditions. A nomenclature, on the other hand, is essentially a list of approved terms for stating clinical observations in order that such terms may be uniformly used and understood. By its very nature, a nomenclature must provide a distinct and separate term for each morbid condition that can be specifically described. A nomenclature and a classification will not be confused if their respective fundamental purposes are understood.

The appropriate reference for describing diseases is the Standard Nomenclature of Diseases and Operations.[2] This universally accepted nomenclature is based on the simple principle that every disease

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has an anatomic and an etiological component. Consequently, its basic arrangement is anatomic, diseases being listed according to the major anatomic regions with the initial section covering the psychobiological unit for psychiatric diagnoses and the second scheduling the body as a whole for systemic disorders. Within each section for anatomic regions, the etiological factors affecting specific sites are arranged in uniform order. Since the system is extremely flexible, it allows for description of any condition in utmost detail. Utilization of the Standard Nomenclature by physicians can reduce the questionable terminology that sometimes appears on death certificates. Thus proper use of the nomenclature in describing diseases will aid proper use of a classification in grouping them.

History.—Attempts to classify diseases developed in remote times; recent systems originated in the early 18th century. In 1854, the first general agreement was reached on a system of classification, limited to causes of death. Modifications in this International List of Causes of Death were made at intervals. More widespread adoption of the Bertillon classification (1893) occurred, the American Public Health Association in 1898 urging its adoption throughout Canada, the United States, and Mexico and further recommending its revision every 10 years. Such revisions have, in fact, been made at approximate decennial intervals since that time. The sixth revision (1948) was retitled the International Statistical Classification of Diseases, Injuries, and Causes of Death (ISC) and comprised for the first time a combined morbidity-mortality schema, the groundwork for which had been laid as far back as 1856.[3] The seventh revision (1955), effective in the United States this year (1958), is a relatively minor modification of its predecessor.[4]

Classification Revision.—The need for regular revision of a classification of diseases is obvious if the schema is to reflect modern medicine. Identification of disease organisms and their grouping, the recognition that apparently systemic disorders represent dysfunctions of certain organs, the tracing of deficiency diseases, new knowledge of the etiology of specific diseases—all such medical advances require change in the structure of the classification to allow adequate analysis. Obviously, revisions must follow not only the discoveries but also the acceptance of the facts by the medical profession. At the same time, the system must allow for wide variation of familiarity with most recent medical advances and modern medical nomenclature. It can at best reflect the average medical sophistication, if it is to be of practical use.

Changes in the structure of the classification (and other factors) may, however, introduce differences in the statistics that obscure determination of trends for specific conditions. A major break with the past, for example, occurred with the adoption of the sixth revision of the International Statistical Classification in 1949; substantial proportionate decreases were effected in deaths ascribed to such conditions as nephritis, diabetes, and syphilis, while increases resulted for such conditions as rheumatic fever, diarrhea and enteritis, influenza, and cerebrovascular lesions.[5]

In the New York City series,[5b] for example, there were reported 52,517 deaths that had been coded according to both fifth and sixth revisions of the International Statistical Classification. Of these, 2,367 were classified as due to diabetes mellitus under the old system. Under the new system, only 1,054 of the 52,517 deaths were ascribed to this disease, a reduction of 65%. For 1,038 of the deaths, the change in procedure had no effect; they were charged to diabetes under both methods. But 16 deaths were added to the diabetes count (under old system cause of death attributed to cancer in 6 instances), and 1,329 were assigned to causes other than diabetes under the new system. The majority of the deaths transferred from diabetes to other causes were charged instead to arteriosclerotic heart disease (713), with a substantial number going to hypertensive disease (242) and cerebrovascular lesions (185). Such aberrations were caused, to some degree, by the change in the classification. But, to a major extent, they resulted from the adoption of a new method of medical certification and of the manner of selecting the primary or underlying cause of death.

Little further effect on long-term series should result from introduction of the seventh revision this year, since modifications have been deliberately limited. Some realignment of mortality within the cardiovascular-renal group may be expected however, although not of the same degree as in 1949. Hypertension and hypertensive heart disease can be expected to show some increase at the expense of arteriosclerotic heart disease. To that extent, arteriosclerotic etiology receives less emphasis in the seventh revision than in the sixth revision. The exact extent of change cannot now be determined, but seems unlikely to be radical.

Sudden breaks in long-term trends due to classification or certification changes are generally identifiable, and adjustments may be made to counteract their effects in analysis. More subtle influences derive from the dynamic state of medical science. Dissemination of new knowledge can result in more specific etiological statements that require assignment of a disease to a different category than that used for the earlier, more obscure description. Alteration of medical opinion may cause an apparent decline in one condition and contribute to the rise of another. Sudden and unattended deaths, in years past, were often ascribed to heart failure, acute indigestion, and stroke, for example; at present most of such deaths are said to be caused by coronary artery disease. Mortality from the former conditions shows little variation over recent decades, despite increases in the aged population, but part of the rise in the death rate for arteriosclerotic heart disease (including coronary artery disease) may have been caused by this shift in diagnosis.

Selection of Primary Cause of Death

The primary or underlying cause of death is defined as that condition or injury (or circumstances of the injury) that initiated the train of morbid events leading directly to death. In populations with high mortality and short life expectancy, death is most often caused by infectious or communicable disease. Under such circumstances, the cause of death can often be expressed as a single term. As length of life increases, however, with the conquest of such diseases, aging permits the development of degenerative processes that affect many body systems. The question then arises as to which of several existing conditions caused death. The clinician may logically say that none of the diseases singly, in a specific patient, caused death, but rather the complex of conditions. But the classification does not provide for combinations of diseases in most instances. Moreover, preventive medical programs have traditionally sought information regarding the initiating factor in the disease sequence leading to death, in order that efforts toward prevention might be placed at the start of the process.

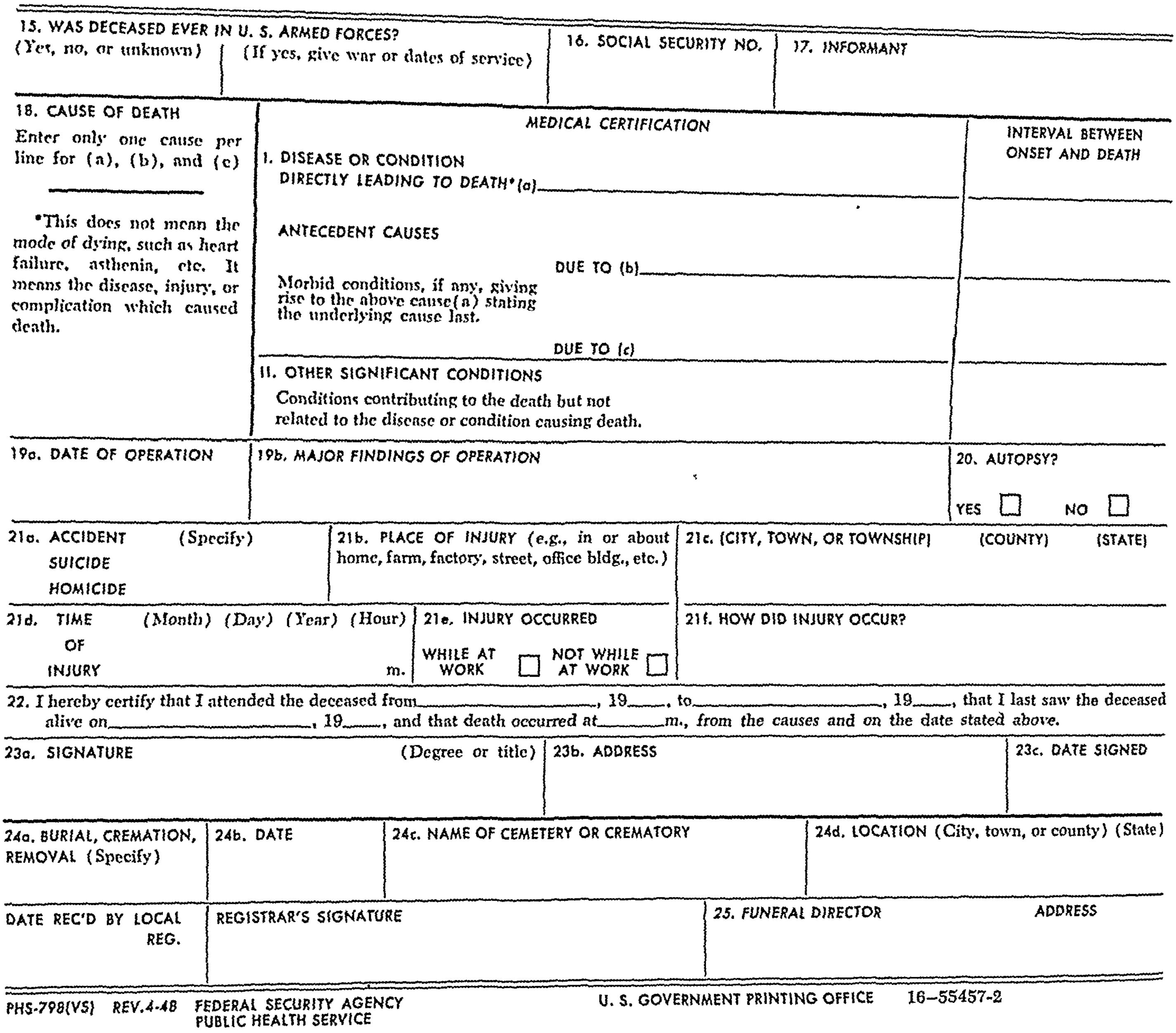
Whose Responsibility?—It has always been recognized that intimate knowledge of the individual patient and the course of the several conditions from which the patient was suffering provided the only reasonable bases for selecting a single underlying cause of death. Solely the physician in attendance, therefore, can judge adequately which of several conditions was the most important factor in the death of the patient. Consequently, death certificates formerly asked the physician to name the "primary cause" or "principal cause" and to state separately "contributory causes." But physicians were often confused by this terminology. "Primary" or "principal," intended to mean the "underlying" or initiating," disease was often interpreted to signify the terminal state instead. Moreover, different physicians interpreted the terms in varying fashion, compounding the difficulty for the vital statistics office of understanding their intents in completing the death certificates. To clarify the situation, the physician was then asked to underline the cause to which he believed the death should be ascribed in mortality tabulations, but even this method was not at all satisfactory, for few physicians troubled to underline any of the conditions on the certificates.

Need for Rules.—Because the intent of the certifying physician was frequently unclear, methods for selecting the cause of death varied from place to place. Hence, comparison of mortality statistics was hazardous. To ensure uniform selection of the underlying cause by the nosologist regardless of the manner in which the physician expressed himself, a standard procedure was devised. In the United States, the Manual of Joint Causes of Death, used for many years prior to 1949, determined precedences (or priorities). For tabulation purposes, when two or more diseases were reported on the same death certificate, reference to the manual directed which of the conditions was to be selected as the cause. A priori decisions, based on judgment as to the relative clinical severity of various diseases, generously influenced, it must be admitted, by interest in specific conditions, determined the selection. Investigations showed, fortunately, that this arbitrary procedure reflected the physician's opinion as to underlying cause in most instances.[5] However, under the method adopted in 1949, designed specifically to improve the situation, a substantial number of deaths are still subject to misclassification, as will be subsequently seen, because of continued need for arbitrary rules.

Present Method.—It was the abandonment of this arbitrary practice that had much to do with the major disturbances of trend data in 1949, for a new mechanism was then introduced to place the responsibility for selection of the underlying cause where it belongs—on the attending physician. Long experimentation in Great Britain with a medical certification form that would accomplish such a purpose led to the adoption by the World Health Organization (WHO) of an internationally recommended format modeled on the British experience; this format, used throughout the United States since 1949, is illustrated in the figure. Essentially, it provides for medical certification in two parts: the *first part includes several lines for the physician to* state either a single condition (for example, scarlet fever) or a pathologically or etiologically related sequence of conditions with the most recent manifestation stated first (for example, septicemia due to gangrene due to diabetes). Part II of the medical certification allows for the reporting of other significant conditions contributing to the death but not directly related to the disease last named in part I.

When the medical certification has been properly completed, the cause selected for tabulation will be the last-mentioned condition in part I of the certification. Thus, the physician determines the underlying cause of death and directs its selection by the manner in which he completes the record. For example, if the physician reports in part I: (a) coronary thrombosis due to (b) arteriosclerosis due to (c) diabetes mellitus, and leaves part II blank, *the death will be charged to diabetes. On the other* hand, if he completes the certification thus: I (a) coronary thrombosis due to (b) arteriosclerosis due to (c) (no entry), II diabetes mellitus, the arteriosclerotic heart disease will be considered the underlying cause of death for tabulation.

Unfortunately, despite the ease of correct reporting, in many instances it is necessary to resort to rules for selection of the underlying cause. The physician may report a related sequence in apparently reverse order (as indicated by the probable etiological relationships or by the duration intervals stated for the various conditions in the sequence); or he may record clearly unrelated conditions in part I (for example, diabetes [due to] inguinal hernia). The nosologist in the vital statistics office has only two courses open: to query the physician, who is acutely annoyed as a result, or to decide the issue in some systematic way. Unless the physician is asked to clarify his intent in the instance cited, or if he fails to respond, death will be charged to diabetes on the reasoning that the physician must have considered that disease more important since he stated it first and that, hence, he really meant to report the inguinal hernia in part II.



15. WAS DECEASED EVER IN U. S. ARMED FORCES?
(Yes, no, or unknown) (If yes, give war or dates of service)
16. SOCIAL SECURITY NO.
17. INFORMANT

18. CAUSE OF DEATH
Enter only one cause per line for (a), (b), and (c)

*This does not mean the mode of dying, such as heart failure, asthenia, etc. It means the disease, injury, or complication which caused death.

MEDICAL CERTIFICATION
I. DISEASE OR CONDITION DIRECTLY LEADING TO DEATH*(a)
ANTECEDENT CAUSES
Morbid conditions, if any, giving rise to the above cause(a) stating the underlying cause last.
DUE TO (b)
DUE TO (c)
II. OTHER SIGNIFICANT CONDITIONS
Conditions contributing to the death but not related to the disease or condition causing death.
INTERVAL BETWEEN ONSET AND DEATH

19a. DATE OF OPERATION
19b. MAJOR FINDINGS OF OPERATION
20. AUTOPSY?
YES ☐ NO ☐

21a. ACCIDENT SUICIDE HOMICIDE (Specify)
21b. PLACE OF INJURY (e.g., in or about home, farm, factory, street, office bldg., etc.)
21c. (CITY, TOWN, OR TOWNSHIP) (COUNTY) (STATE)

21d. TIME OF INJURY (Month) (Day) (Year) (Hour) m.
21e. INJURY OCCURRED
WHILE AT WORK ☐ NOT WHILE AT WORK ☐
21f. HOW DID INJURY OCCUR?

22. I hereby certify that I attended the deceased from________, 19___, to________, 19___, that I last saw the deceased alive on________, 19___, and that death occurred at____m., from the causes and on the date stated above.

23a. SIGNATURE (Degree or title)
23b. ADDRESS
23c. DATE SIGNED

24a. BURIAL, CREMATION, REMOVAL (Specify)
24b. DATE
24c. NAME OF CEMETERY OR CREMATORY
24d. LOCATION (City, town, or county) (State)

DATE REC'D BY LOCAL REG.
REGISTRAR'S SIGNATURE
25. FUNERAL DIRECTOR
ADDRESS

PHS-798(VS) REV.4-48 FEDERAL SECURITY AGENCY PUBLIC HEALTH SERVICE
U. S. GOVERNMENT PRINTING OFFICE 16—55457-2

Medical Certification Form for Reporting Deaths

The situation is not always this clear-cut. A certification may be filed with the cause of death stated as follows: I (a) gangrene due to (b) arteriosclerosis and diabetes, with part I (c) and part II left blank. The three conditions together form an etiologically related process in which diabetes was the initiating disease. However, arteriosclerosis could have led to gangrene in the absence of diabetes. The practice under circumstances where two different etiological sequences are equally possible is to accord preference to that sequence first completed. In this case, therefore, the death would be ascribed to arteriosclerosis. It might be argued that a reasonably complete sequence exists and that diabetes should hence be considered as the underlying cause. But in most comparable situations the three conditions mentioned cannot be considered to form an etiologically related complex even though each of those on line (b) bears an independent etiological relationship to the disease on line (a). The rule therefore instructs the nosologist to select the first condition mentioned on line (b) that completes a logical sequence when such anomalous reports are received.

The rules that guide the nosologist in such situations have logic in them, but no rules can adequately substitute for an unambiguous, clear statement by the physician. It has been estimated that these arbitrary procedures may result in the classification of as many as 5% of the deaths to conditions other than those which the physician intended to indicate as the underlying cause.[7] This means improper classification of more than 80,000 deaths each year in the United States—more than the entire number usually occurring in the city of New York in a year! Simple attention to proper completion of the death certificate could correct this error.

Measures to Insure Uniformity

Although general rules for selection of the underlying cause of death have been established in connection with the classification itself,[8] the National Office of Vital Statistics of the Public Health Service acts as the final authority to assure uniform treatment throughout the United States of certifications that are apparently improperly completed or contain peculiarities unique to this country. This office distributes to all vital statistics offices, and to others engaged in cause of death coding, copies of the instruction manual prepared primarily for its staff.[9] The instructions derive from questions arising in coding causes of death as reported on certificates transmitted from every state and territory. When the same question has been noted a specific minimum number of times (to assure that it is not unique), a decision is made in consultation with clinicians as to how the question should be resolved to reflect the probable intent of the certifying physician. The question may then be found to be a special case of an existing rule of procedure, or, if necessary, a new rule will be established so that all similar certifications will be coded alike. Obviously, the lay coding staff must be well versed in anatomy, physiology, pathology, and etiology for this type of work. The distribution of the instruction manual throughout the country encourages uniform treatment of similar certifications in each of the agencies processing death records.

As a routine training measure for technicians, the National Office of Vital Statistics also publishes a four-page release entitled "Nosology Guidelines." Each month a specific aspect of mortality-cause coding is discussed in detail; in addition a series of medical certifications are presented as examples of difficult coding problems with their solution and an explanation for each one. More formal training in cause of death classification is provided by teams of instructors from the national office, particularly in advance of the introduction of revisions of the classification. Such "training institutes" are held in various cities so that personnel of all agencies may participate. The courses, usually of a week's duration, are designed not only for beginners but also for experienced coders to give more intensive instruction to supervisory personnel who must in turn train additional staff at the state and local level.

Other organizations are also active in these efforts to maintain comparability and to make the product more useful. The Public Health Conference on Records and Statistics, through a standing committee on mortality statistics, carries on continuous investigations to improve procedures, to establish exactly what physicians mean by certain terms they use, and to seek new approaches. *Ad hoc* committees of the American Public Health Association (APHA) and of the American Association of Registration Executives address themselves to both specific and general questions regarding mortality statistics as they arise. The most recent report, prepared by a committee of the statistics section of the APHA, discusses current problems in mortality statistics.[10] The National Committee on Vital and Health Statistics also directs investigations into problems related to classification and other aspects of mortality and fetal death statistics, as will be cited later. Comparable groups in other countries are similarly engaged; the efforts to improve every step, from initial reporting by the physician to final result in tabulations, are universal.

As an international health agency interested in comparability of mortality statistics from country to country, the World Health Organization publishes in many languages instructions to physicians in the proper completion of the medical certification, recognizing the prime importance of thoughtful accuracy in the basic document.[11] Discussions involving coding, tabulating, and interpreting data are also published.[12] Specifically for the clarification of problems connected with these procedures as they occur throughout the world, as well as to investigate methodological devices, WHO has also established a Center for the Classification of Diseases, which is attached to the General Register Office of Great Britain.

Multiple Causation of Death

It is obvious from the discussion that we have made progress in one direction: the person in the "know," the attending physician, has the opportunity to determine the cause to which the death will be charged in single-cause tabulations.

In common with many statistical series, mortality data are limited by their very nature; they refer to the dead rather than to the living population. For fatal illness with a short course, the facts about the dead may be extremely useful approximations of those facts about the living with a specific disease. But for most diseases characterized by a lengthy course, the use of mortality statistics for estimating morbidity or for assessing the characteristics of persons with such diseases may be quite misleading. The frequency of concurrent diseases, especially among the aged, further complicates interpretations. Hence, we are far from satisfying medical needs for morbidity or mortality information. For many purposes it may be sufficient to know, for example, that, as reported by physicians, diabetes was the major factor in a given number of deaths. For other purposes, however, it would be useful to know how many persons had diabetes at the time of death, even though many of them died of other underlying causes. Even more useful would be the knowledge as to how many of those with diabetes exhibited vascular or renal damage.

Multiple Cause Tabulations.—Information on the association between reported diagnoses can be obtained, within limitations, from the present type of medical certification by tabulating all the conditions mentioned by the physician. However, the preparation of multiple-cause tabulations in a vital statistics office is a heroic undertaking. The task of coding many conditions (and some death certificates in New York City now contain as many as seven distinct diagnoses) is time-consuming. Moreover, questions arise as to what constitutes a distinct diagnosis, that is, should all clinical manifestations of disease processes be coded or not? If septicemia, gangrene, and diabetes are all reported, for instance, should all three be coded, or only the major condition?

Although multiple coding takes time, it is manageable; determination can also be made, with clinical and research advice, as to what constitutes a distinct diagnosis for tabulating multiple diagnoses. But then tabulating problems come to the fore. How are the data to be managed to allow intelligent interpretation? Simple tallies of the number of times each condition was reported could easily be prepared. Then the proportion of deaths in which each was a factor could readily be calculated, as Treloar[13] has recommended. For example, among deaths of persons 65 or more years of age in New York City in January, 1954, 8.7% were ascribed to cerebrovascular lesions. But multiple-cause tabulations indicated that a minmum of 17.1% had suffered such attacks prior to death. Similarly, 2.6% of these deaths of the aged were charged to diabetes, but diabetes was reported as a factor in 7.2%.

Without great difficulty it could be determined also how frequently diabetes occurred on the records together with gangrene, hypertension, arteriosclerosis, or chronic nephritis. But the feasibility of cumbersome four-dimensional or five-dimensional tables to show joint frequencies of some or all of these combinations appears remote. For any single major cause the problem may not be insurmountable, but the vital statistics office must serve many interests. The preparation of such tabulations for a multiplicity of diseases becomes gargantuan; the possibility of their regular analysis is well-nigh unthinkable.

Limitations.—Despite these difficulties, the interest to be served might warrant the effort, perhaps at lengthy intervals, as special studies. But some genuine scepticism would be appropriate for any conclusions that might be drawn. It was initially pointed out in this paper that the validity of mortality statistics depends on the completeness and accuracy of the reporting of diagnoses by the attending physician. The value of multiple cause tabulations depends on the extent to which the physicians report associated and contributory conditions. While some physicians report as many as seven diagnoses for a decreased patient, others record a single cause, even for an aged person.

A recent review of a small sample of death records with the attending physician revealed, for example, that hypertension is often omitted as a factor of consequence. The physician may have concluded, under our present system, that hypertension was not significant and hence omitted it. But such omissions in attempts to investigate associations between diseases might have serious import.

Another source of deficiency may lie in the reporting of about one-fourth of all deaths by the medical examiner, who does not have a complete clinical history of the patient and who did not know the person when he was alive. Citing New York City data, Lew[14] points out that almost 15% of deaths ascribed to arteriosclerotic heart disease and 44% of those classified as due to coronary artery disease were certified by the medical examiner but that autopsy verification was available for only 4 and 8% respectively. Even among deaths from these conditions certified by private physicians, the proportion in which the diagnosis is confirmed by autopsy is well under 10%.

The facts derived from multiple-cause tabulations under present circumstances, therefore, will represent a select group of deceased persons, those whom the signatory physician knew well and for whom he reported all significant pathology. But there is no convenient way of segregating this select group for intensive study. Where multiple-cause tabulations are currently attempted, they represent to a major degree methodological experimentation and the hope that knowledgeable, critical analysis will suggest special studies.

The Future

The spectacular decline of infectious and communicable diseases as causes of death have left us as major causes those that affect the two ends of the age scale—infant and aged—and accidents. Although it is recognized that mortality statistics regarding chronic diseases will often give biased information about what we actually seek—morbidity—it must be equally recognized that mortality statistics still serve, and for many years will continue to serve, useful purposes. Such data are continuously criticized, sometimes with justification, sometimes through misunderstanding. But their wide use is a matter of necessity. Reliable morbidity data that we might prefer for specific purposes are rarely available. The established vital statistics system is, moreover, a convenient mechanism for obtaining information about the entire population. Critics can effectively improve the situation by using the material with good judgment as to its limitations, by joining in attempts to improve the basic data, and by encouraging the efforts toward betterment of classification and tabulating procedures. Since mortality data are, and will be, widely used, it behooves us to give thought to methods for their improvement.

Whether the traditional concept of a single cause of death is adequate to current needs is an elemental question that would generate wide serious discussion. Moriyama[7] has expressed the need for such discussion in his description of the development of the present concept, while Treloar[13] has recommended that the death record be designed to elicit fully the disease states existing at the time of death and that attempts to ascribe each death to a single cause be abandoned.

The sixth revision of the ISC, as previously mentioned, combined for the first time a morbidity and a mortality classification to provide a common denominator for mortality statistics and the ever-increasing number of morbidity studies. The main purpose of publishing a seventh revision at this time is to adjust the time for issuance of revisions to the midddle of a decade; the next revision is expected in 1965. The aim is to have the classification and all its appurtenant procedures well established in any decade by the time a census is taken. Such timing permits detailed mortality analyses according to population characteristics, such as age and sex, under the best circumstances, with stability in the tabulations when census data are available for construction of valid rates.

The intervening years until 1965 can profitably be used for studies directed toward suggestions for substantive revisions in the classification that will lead to more meaningful mortality statistics. That section of the classification dealing with the cardiovascular system, for example, is a compromise of anatomic, etiological, and pathological expressions. No clear presentation of any one of these aspects is possible; combined etiologies likewise cannot be dealt with, nor can anatomic involvement be uniformly specified. It often happens, for example, that hypertensive heart disease and arteriosclerosis are reported on the same certificate. Up to this year, such deaths have been charged to the former condition. But, if hypertensive heart disease and arteriosclerotic heart disease were reported together, the death has been charged to the latter. With the seventh revision of the ISC, allocation will depend more on the specific wording of the physician's certification. In any case, it may well be questioned whether the same disease complex may not be operating in both situations.

On the other hand, a cerebrovascular accident is classified on an anatomic basis without reference to etiology at all, unless the physician specifically states that the lesion was caused by "malignant hypertension." In such a circumstance, death will be charged to hypertension. If "hypertension," otherwise unqualified as to activity, is stated as underlying etiology, it will be ignored and the death will be ascribed to the cerebrovascular lesion. Some recommendations have already been made for improvement of the cardiovascular classification.[15] It is not too early for such proposals to be reviewed in a constructively critical manner in order that they may be amended, extended, or otherwise modified to permit the most productive use of mortality statistics on cardiovascular disorders.

The rise of interest in perinatal mortality has made cause classification of fetal and infant deaths by separate and uncoordinated systems an anachronism. A subcommittee of the National Committee on Vital and Health Statistics is presently drafting a comprehensive group of disease categories that will effectively summarize those conditions that are peculiar to fetal and infant loss. These proposals will likewise have to be carefully examined, particularly by obstetricians, pediatricians, and pathologists. Furthermore, actual experimentation in their use will be required in a few vital statistics offices, a number of hospitals, and by several pathologists to assure their practicability and adequacy.

Expert recasting of the sections of the ISC dealing with neoplasms and with psychobiological disturbances is needed to satisfy critics of their deficiencies. Other sections of the code can also undoubtedly be improved. Disease-complex type of categories may be suitable in other parts of the classification schema, just as they have been suggested for the cardiovascular sections. Interest in research, the aging of the population, and increased frequency of concurrent but separate degenerative processes may signify need for rather broad use of combinations of disease complexes in lieu of multiple-cause tabulation of mortality data.

Finally, in some way, the physician must be influenced to change his attitude that the death certificate is "just paper work," that its completion is a last rite for someone no longer of clinical interest, that it represents merely another bit of bureaucratic red tape. The vital statistics office in any locality has proved to be for many physicians one vast "record room" where they have been able to obtain community-wide information for epidemiologic research in such widely separate areas as amaurotic familial idiocy (Tay-Sachs disease) and leukemia. The same source is tapped for end-results of specific therapy for cancer and of surgical or other treatment of many additional diseases. The major users of information on death certificates are physicians, not alone those in public health, but research clinicians, pathologists, and practicing physicians with special interests. The attending physician, therefore, in completing the death certificate, is fundamentally transmitting information to his colleagues. His respect for them should be adequate incentive to do the job right.

No research carelessly, haphazardly, thoughtlessly done is worth credence. Obervations compiled by a clinician or other scientist who recorded what seemed "acceptable" rather than what he actually observed would contribute little to human knowledge. In similar fashion, the worth of mortality statistics depends basically on the validity, or truth, if you will, of the cause of death recorded by the physician. Much is made of the discrepancies often noted between clinical and autopsy diagnoses. Although such discrepancies are significant for individual patients, they do not materially affect many statistical distributions because there are in large measure compensating errors among diseases. Moreover, we should not expect mortality statistics to be better than diagnostic ability; the physician can relate no more in describing the cause of death than he knew in treating the patient.

Too often, however, the physician admits that the cause of death as stated represented merely what he "knew the health department would accept." In the final analysis, the health department will accept whatever the physician reports, provided it makes sense, represents a reasonable diagnostic statement, and contains enough information to allow its classification as a cause of death. When the cause of death is questioned by a health department representative, it does not mean that the physician's judgment is being impeached by someone who never saw the patient. A query merely means that the physician has either failed to express himself adequately or has omitted information essential for proper classification.

Perhaps the best proposition the physician might have in mind when he records the cause of death is this: Suppose I had been treating this patient for a number of years, but because of circumstances another physician was in attendance when the patient died. How should the attending physician complete this death certificate best to inform me (for follow-up of my patients, say) of the facts at the time of death in view of the patient's history and course? What was the train of morbid events that led to death, traced back from the final manifestation to the originating disease? What other conditions, apart from this sequence, were significant by increasing stress on this patient? Such a straightforward statement, thoughtfully prepared from knowledge of the patient and of his history, is the cause of death as it should be summarized on the death certificate.

Summary

Mortality statistics have many useful purposes. They are, however, limited by their nature; no more should be expected of them than they are capable of producing. Continuous efforts are made to improve the accuracy and usefulness of mortality data. Physicians are encouraged to report adequately their best clinical judgment; they are led to select the cause of death for tabulation purposes by the arrangement of the medical certification form. Many groups, local, national, and international, are always seeking methods of improving the value of mortality statistics by experimenting with classification changes, new procedures, and different types of tabulations. Basically, the reporting physician determines the validity of mortality statistics; his thoughtful attention to this major role will aid his community and his colleagues.

125 Worth St. (13).

References

1. Standard Nomenclature of Diseases and Operations, editorial, J.A.M.A. **163**:552 (Feb. 16) 1957. Crosby, E.L., and Fales, W. T.: Nosology—for Administrators: Why Disease Classification Is Hospital Problem, Hospitals **22**:59-61 (Aug.) 1948.

2. Standard Nomenclature of Diseases and Operations, edited by R. J. Plunkett and A. C. Hayden, ed. 4, published for American Medical Association, Philadelphia, Blakiston Company, 1952.

3. Manual of International Statistical Classification of Diseases, Injuries, and Causes of Death, Sixth Revision of International Lists of Diseases and Causes of Death, Geneva, World Health Organization, 1948.

4. Manual of International Statistical Classification of Diseases, Injuries, and Causes of Death, Seventh Revision of International Lists of Diseases and Causes of Death, Geneva, World Health Organization, 1955.

5. (*a*) Valois, A. B.: Changes due to Sixth Revision of International Statistical Classification of Diseases, Injuries and Causes of Death, Canad. J. Pub. Health **43**:434-441 (Oct.) 1952. (*b*) Erhardt, C. L., and Weiner, L.: Changes in Mortality Statistics Through Use of New International Statistical Classification, Am. J. Pub. Health **40**:6-16 (Jan.) 1950. (*c*) Marks, H. H.: Diabetes and Revised International List of Causes of Death, Proc. Am. Diabetes A. **9**:349-361, 1950. (*d*) World Health Organization: Comparability of Statistics of Causes of Death According to Fifth and Sixth Revisions of International List, Bulletin World Health Organization, supp. 4, New York, Columbia University Press, 1952.

6. Fales, W. T., and Moriyama, I. M.: International Adoption of Principles of Morbidity and Mortality Classification, Am. J. Pub. Health **39**:31-36 (Jan.) 1949.

7. Moriyama, I. M.: Development of Present Concept of Cause of Death, Am. J. Pub. Health **46**:436-441 (April) 1956.

8. Reference 4, pp. 359-371.

9. Vital Statistics Instruction Manual: Part II. Cause of Death Coding, First Draft—1958 U.S. Dept. of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics, July, 1957.

10. Committee on Medical Certification of Causes of Death: Problems in Medical Certification of Causes of Death, Am. J. Pub. Health **48**:71-80 (Jan.) 1958.

11. World Health Organization: Medical Certification of Cause of Death: [illegible] on Use of International Form of Medical Certificate of Cause of Death, Bulletin World Health Organization, supp. 3, New York, Columbia University Press, 1952. Amplification of Medical Certification of Cause of Death, Geneva, World Health Organization, 1953.

12. Supplementary Interpretations and Instructions for Coding Causes of Death, Geneva, World Health Organization, 1953.

13. Treloar, A.: Enigma of Cause of Death, J.A.M.A. **162**:1376-1379 (Dec. 8) 1956.

14. Lew, E. A.: Some Implications of Mortality Statistics Relating to Coronary Artery Disease, J. Chron. Dis. **6**:192-209 (Sept.) 1957.

15. Weiner, L.; Bellows, M. T.; McAvoy, G. H.; and Cohen, E. V.: Use of Multiple Causes in Classification of Deaths from Cardiovascular-renal Disease, Am. J. Pub. Health **45**:492-501 (April) 1955. Reference 9.

INDICATIONS AND CONTRAINDICATIONS FOR TRACHEAL FENESTRATION

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Tracheal fenestration is a surgical procedure that results in a firmly epithelialized mucocutaneous opening into the trachea, provided with lip-like valves that can act like a closing mechanism. It obviates the use of a metal cannula, and the naked opening admits semirigid catheters of sufficiently wide bore to permit effective suction for the removal of bronchial secretions in severe forms of pulmonary disease. The critical factor in the evolution of such disease is not the quantity of secretions but a reduced pulmonary reserve and a failure of the cough-mechanism. The effects of aspiration extend beyond the immediate relief from discomfort and asphyxia; often it is followed by continued improvement so that the frequency of aspirations becomes less and exercise tolerance improves. All patients eventually learn to perform the catheterizations themselves. The flaps of the fenestra permit little escape of air, and by applying suitable pressure to the flaps the patient can cough and expectorate by mouth normally. Indiscriminate use of tracheal fenestration must be avoided. It should not be used merely as a short-cut treatment for profuse cough and expectoration, nor should it be used as a substitute for operation in pulmonary suppuration.

In a preliminary report we recently introduced a new method of treatment of pulmonary insufficiency by a procedure to which we gave the name tracheal fenestration.[1] Already an unusual interest has been shown in this apparently simple surgical procedure enabling patients to practice on themselves suctioning from the depth of the airways. On superficial view this procedure appears to be merely a modified tracheostomy made for the sole purpose of bronchial aspirations in patients with inadequate expectoration. There is therefore a danger of its indiscriminate use as a short cut in treatment of all patients having excessive bronchial secretions, regardless of the underlying pulmonary disease.

For reasons discussed in our recent publication, we proposed tracheal fenestration as a treatment of pulmonary insufficiency. We emphasized that no final conclusions could as yet be reached regarding its effectiveness, nor could we adequately explain its mode of action in relieving critical dyspnea in patients with scant secretions. This, as well as the indications for the procedure, remains to be clarified through further studies in a variety of far-advanced chronic pulmonary diseases.

Lest this method of treatment become discredited through misuse, it seemed to us essential that we further discuss the present status of its indications. This can best be done through a brief review of its evolution and of the clinical experience from which this procedure was evolved and through our interpretation of its possible mode of action.

Evolution of Tracheal Fenestration

The use of tracheal fenestration evolved from years of clinical observations in the treatment of patients suffering from pulmonary insufficiency. Our experience included patients in whom tracheostomy was performed as an emergency measure, because it seemed apparent that if the airways could be kept clear the patients might be tided over a critical period. It has been a long known fact that the lives of many patients under such conditions may so be significantly prolonged. It is also well known that at such periods of critical pulmonary insufficiency tracheostomy may be a heroic measure of double-edged potentialities which may even precipitate fatal cardiopulmonary failure.[2] Furthermore, conventional tracheostomy with metal cannula affords only temporary relief. Frequent catheterization and vigorous aspiration by way of metal cannula soon becomes troublesome due to rough handling involved by frequent to-and-fro movements of catheters. The granulating stoma causes too much pain, frequent bleeding, and local infections, all too often forcing early withdrawal of the cannula and closure of the stoma. Last but not least tracheostomy is at best only a temporary measure which does not answer the purpose in the presence of pulmonary insufficiency which is permanent.

Our experience indicated the need for a modified tracheostomy to meet certain requirements, namely, one that obviates the use of a metal cannula, that will remain permanent and yet permit opening and closing at will, that will admit semirigid catheters of wide bore to permit effective suction, and that can endure much abuse as well as resist infection.

These requirements obviously called for a firmly epithelialized mucocutaneous opening into the trachea, provided with lip-like valves that could act as a closing mechanism. Accordingly, we initiated animal experimentation in which we obtained the surgical collaboration of Dr. E. E. Rockey. Out of these experiments was evolved the procedure described as tracheal fenestration.[3] This procedure, which, as will be shown later, has its pros and cons, has met the above requirements quite satisfactorily in a limited number of patients on whom it has been recently performed. (All fenestration operations were performed by Dr. Rockey.)

Clinical Observations on Effects of Aspirations with Tracheostomy

Clinically a most unexpected feature was relief from pulmonary disability which frequent aspirations brought to patients who previously had had little cough and scant expectoration. This effect seemed all the more paradoxical since it occurred in spite of a marked increase of secretions aspirated by catheterization after tracheostomy, yet this result was so striking that it led us to the conclusion that a change from a dry to a wet state of the lungs was the clue to the effectiveness of treatment. This effect seemed to be confirmed also by the observation that immediately postoperatively, when catheterization and suctioning was being performed by way of the conventional tracheostomy opening, relief of symptoms appeared proportionate to the quantity of secretions aspirated. Also frequent aspirations appeared to be an important factor in the treatment. All of this naturally suggested that aspiration of excessive secretions should be the primary goal and purpose and that the main effect of tracheostomy is to make feasible more efficient mechanical removal of bronchial secretional obstructions. The mode of action of this treatment would then be fully explained by more efficient ventilation. Holding this belief, one would naturally conclude that accumulation of bronchial secretions is the sole indication for tracheal fenestration. To explain the favorable effect in patients with scant expectoration, it is therefore necessary to assume that prolonged accumulation of bronchial secretions is the cause of pulmonary disability in these cases and that there is no such condition as so-called dry emphysema.

However, from our observations we are convinced that the marked increase in aspirated secretions is the effect of the procedure itself and that much hypersecretion is freshly induced by frequent intubations and strong suctioning, which invariably cause severe coughing. Last but not least the effect of the intervention on the trachea by the creation of two openings must also be included. As will be shown later there is reason to believe that increased fluid filtration and hypersecretion in the depth of the lungs may itself be the most important factor in the effectiveness of the treatment. Equally important is maintenance of a steady elimination by suctioning to keep pace with the increased filtration and secretion. Significantly, by the time the tracheal fenestration has healed sufficiently so as to permit catheterization, the quantity of aspirated secretions is greatly reduced, yet the patients continue to improve and their exercise tolerance increases in reciprocal proportion to the secretions produced. The clinical observations just described can best be explained by the relationship between bronchial secretions and pulmonary insufficiency, a subject that we have already discussed in recent publications and will only briefly touch on here.

Relationship Between Secretions and Pulmonary Reserve

It is a clinical fact that patients with the most severe and diffuse forms of pulmonary emphysema cough and expectorate very little. Conversely, patients with extensive bronchitis and bronchiectasis with much expectoration usually show mild emphysematous changes. We described this as incompatibility between extensive diffuse emphysema and bronchitis with copious expectoration.[4] Experience has convinced us that, on the one hand, patients with severe emphysema tolerate with difficulty the complication of bronchitis with excessive secretions and that, vice versa, patients with extensive bronchitis and profuse secretions cannot tolerate overt emphysematous changes in the lungs. Combinations of emphysema with bronchitis usually fluctuate between these two extremes of much emphysema with little bronchitis and much bronchitis with little emphysema. The severity of emphysema determines the extent of bronchitis, and conversely the extent of the latter determines the severity of emphysema compatible with life.

Clinical experience has convinced us that pulmonary reserve and not quantity of secretions is the critical factor in the evolution of chronic pulmonary diseases. As a rule patients have little difficulty in expectorating even enormous quantities of secretions from their airways when their reserve of functioning lung parenchyma is adequate. Only when the pulmonary reserve becomes inadequate and the lungs begin to show signs of emphysematous overdistention do they begin to suffer from progressive "cough failure" with insufficient expectoration and dyspnea. Naturally, with equally low pulmonary reserves patients with large amounts of secretions are apt to develop "cough failure" sooner than patients with scant secretions.

Recently we pointed to clinical experience showing that in severe emphysema with almost complete lack of secretions drugs which bring about return of secretions or even their temporary increase often afford relief from dyspnea, just as in asthma relief from an attack is often marked by an outpouring of secretions. Likewise in tracheostomy clinical experience indicates that relief from dyspnea is associated with marked increase of aspirated secretions, which occurs particularly in the early postoperative days at the beginning of catheterization. Change from a state of little or no secretions preoperatively to that of profuse secretions aspirated postoperatively is so marked as to have suggested that one is dealing with a change from dry to wet emphysema. That this excess of secretions could have long remained accumulated in the emphysematous lungs is of course inconceivable. Furthermore there is no obvious reason why dyspnea should be less with wet than with so-called dry emphysema.

Mode of Action of Bronchial Aspirations in Pulmonary Insufficiency

Change from a dry to wet state of the lungs is a remarkable phenomenon which may provide the answer to the relief obtained with tracheal fenestration from the dyspnea of pulmonary insufficiency. When this answer is known, it may well shed light on the problem of pulmonary insufficiency itself. It is possible that this new method of treatment can open up new approaches to the study of this complex problem.

Admittedly we have no definite answer to the question, but we should like to refer to some pertinent considerations, albeit theoretical, previously mentioned by us in discussions of emphysema.[5]

The structural and functional integrity of the pulmonary parenchyma is conditioned upon the normal regulation of blood perfusion in the complex capillary bed of the bronchioles and alveoli from the double blood supply of pulmonary and bronchial arterioles. Bronchiolitis with secretion of tenacious mucus plugging the terminal airways is characteristic of asthma as well as of emphysema, indicating disturbance in the bronchioloalveolar circulation and in the fluid filtration which normally acts to flush out the bronchioloalveolar spaces. This fluid filtered out from alveolar capillaries is known to have the singular mucolytic power required for the normal self-cleansing of the terminal airways of the lungs.[5] Our experience suggests that this fluid presumably derived from the alveolar capillaries in increased amounts after vigorous suctioning possibly also has marked bactericidal power. We say this because even heavy purulent sputum changes within 48 hours after suctioning has begun into the same type of viscid but clear whitish secretion that is aspirated at that period in practically all patients.

On the basis of these considerations it is our assumption that frequent catheterization with powerful suctioning in the depth of the lungs probably acts by way of correcting the pressure levels in the flow of blood and air. This could reestablish functional integrity in the bronchioloalveolar spaces and structures, and as normal circulation and filtration returns there is an increased circulation of fluid with improved self-cleansing. The latter then enables the lungs to recover the function of all available air spaces and operate with these at full compensatory capacity.

In our preliminary report we mentioned untrapping of trapped air behind bronchiolar obstructions as a possible factor. This was suggested to us by long-range observations of patients whose lives were greatly prolonged by persistent conventional tracheostomy in spite of low pulmonary reserve. These patients used catheterization as a means of relieving a sensation of chest tightness when they could no longer aspirate secretions. Watching these patients suggested to us that strong air currents were created in the depth of the lungs.

Finally, a brief remark is in place here on the question of the effect of reduced dead space. We doubt that this is a significant factor. After removal of the tracheal cannula and closure of the tracheostomy opening, patients with tracheal fenestra tell us that they are not aware of any significant leakage of air on breathing. In inspiration the flaps are drawn rather tight. On strong expiration and particularly on coughing there is escape of air and moisture unless counterpressure is exerted on the flaps. When this is done the patients can cough and expectorate by mouth normally. With the flaps closed the dead space is not reduced, yet patients continue to improve.

Problem of Indications

It should be obvious from the foregoing that the exact indications for tracheal fenestration must remain problematic until its mode of action is fully understood. In the meantime the indications will differ according to concepts about its purpose. If it were to be used merely as a more effective method of elimination of excessive bronchial secretions, then all forms of bronchopulmonary suppuration would come within the purview of its indications. Indeed practically all patients with bronchiectasis and even bronchitis with profuse secretions would then be considered candidates for this treatment.

However, we are convinced that, important as elimination of excessive secretions is, it should not be considered the sole purpose. This method of treatment is, we believe, not indicated in bronchopulmonary suppuration except where there is associated emphysema with "cough-failure" and other manifestations of pulmonary insufficiency. As it improves the pulmonary function and as it controls the bronchopulmonary infection with the aid of antibiotics, the excessive secretions will diminish and the patients will be greatly relieved. In fact the favorable results of this treatment are obtained apace with progressively decreasing need for catheterization as the quantity of secretions declines. On the other hand there is reason to believe that this method of treatment will not solve the problem where continuous production of large quantities of purulent secretions persists, requiring continued and frequent catheterization indefinitely.

Tracheal fenestration is not the indicated treatment for localized bronchiectasis. As before, this generally requires resectional surgery. When the disease is bilaterally widespread and complicated by emphysema with difficult cough and expectoration, then tracheal fenestration may be expected to ease and prolong the life of the patient. In chronic bronchitis, recurrent infections often greatly increase the quantity of secretions and so precipitate temporary insufficiency of cough with expectoration. These acute intercurrent attacks usually respond to such modern methods of conservative therapy as the use of antibiotics, postural drainage, expectorants, bronchodilators, and detergent inhalants. Under these conditions, tracheal fenestration would be unwarranted unless permanent pulmonary insufficiency is also present.

Emphysema is associated with bronchiolitis,[5] but frequently there is also complicating infection of the central bronchi. Then the more severe the emphysema the more embarrassing becomes even minimal increase in the amounts of secretions in the airways. The latter can become incompatible with life, and therefore radical and permanent measures are called for. This method of treatment is indicated here primarily because of irreversible pulmonary insufficiency. Efficient prompt removal of even small amounts of secretion becomes a matter of vital importance only because of the associated pulmonary insufficiency. In our preliminary report we have emphasized the fact that in patients with low pulmonary reserve, even trivial respiratory infections, temporarily increasing bronchial secretions, may often cause cough-failure and precipitate attacks of pulmonary insufficiency. The sequence of events by which this may progress to fatal pulmonary hypoventilation has been recently discussed by us.[1] These clinical observations have already led thoracic surgeons to resort to tracheostomy to make feasible vitally needed radical operations (lobectomies or pneumonectomies) for a variety of pulmonary diseases in patients with low pulmonary reserve.[6] Even more frequently tracheostomy has been resorted to in order to tide patients with low pulmonary reserve over periods of pulmonary insufficiency, for example, patients with thoracoplasty. It is probable that in many such patients tracheal fenestration may in the future replace tracheostomy.

Although this is a surgical procedure it is the internist who should establish its indications by all available clinical and laboratory findings including clinical estimates of pulmonary reserve which can best be learned by long-range observations of patients. Pulmonary function studies will be necessary in many instances for more exact estimation of pulmonary reserve. For reasons to be discussed in the future it seems to us that maximal diffusing capacity determinations will perhaps best serve this purpose. This should help us to identify the cases of severe bronchitis with mild emphysema that are temporarily aggravated by periodic flare-up of the bronchitic infection and to separate these from cases of severe emphysema with bronchiolitis that are bound to progress to pulmonary insufficiency. Cardiopulmonary function studies will be required in a considerable number of patients to ascertain the role played by manifestations of cor pulmonale in the clinical picture and to determine how far the latter may still be reversible by this method of treatment. It is yet to be determined at what stage of its development cor pulmonale contraindicates tracheal fenestration. One patient with cor pulmonale of advanced degree and long standing not only tolerated the procedure well but seems to have benefited remarkably.

Pros and Cons of Tracheal Fenestration

The advantages of tracheal fenestration should be obvious from the foregoing. In our long experience with the treatment of critical pulmonary insufficiency by methods now available, we have rarely observed equal amelioration of symptoms. This is all the more remarkable since, in the cases we were so far able to follow, no significant changes in the pulmonary roentgenographic features could be demonstrated.

A disadvantage of this treatment is that it requires two simultaneous tracheal openings. A considerable proportion of patients with increased depth of the chest due to emphysema have short necks and backward displacement of the trachea so as to make the operation a formidable procedure. This is particularly so because of the state of severe pulmonary insufficiency in which these patients usually have to be operated on. In the animal experiments we aimed at a single opening protected by plastic material. However the frequency of catheterizations in the earliest postoperative period interfered with the healing of the tissues. Notwithstanding these now apparently insurmountable difficulties, we believe that surgeons will eventually come up with a method that requires only a single opening.

The question has been raised as to why it is necessary to resort to such a cumbersome operative procedure when a simple tracheostomy has in the past often accomplished essentially the same results. We would stress its permanence as the great advantage of tracheal fenestration. This makes it conveniently available at all times to those patients who are subject to recurrence of attacks, requiring emergency tracheostomy. This should also prove of great advantage in patients with paralyzed chests of any origin (due to poliomyelitis, for example) where there is also disturbed lung function and difficulty in bringing up secretions.

Conclusions

The indications and contraindications of tracheal fenestration still remain to be clarified by future experience in a large number of patients so treated and observed over longer periods. In the meantime decision for operation must be based on long-range clinical study of patients with assessment of their pulmonary reserve, often including functional tests. Chronic bronchopulmonary diseases with excessive bronchial secretions are by themselves not to be considered indications for this method of treatment unless they are associated with pulmonary insufficiency of irreversible degree. Until more is known about the procedure and its potentialities, indiscriminate use of tracheal fenestration is to be cautioned against.

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References

1. Mayer, E.; Blazsik, C. F.; and Rappaport, I.: Tracheal Fenestration, J. A. M. A. **167**:696-701 (June 7) 1958.
2. Brattström, S.: Fatal Unrecognized Respiratory and Hemodynamic Sequelas of Tracheostomy and Endobronchial Aspiration in Postoperative and Markedly Debilitated States, Acta chir. scandinav. **108**:170-178, 1954.
3. Rockey, E. E.; Mayer, E.; and Rappaport, I.: Tracheal Fenestration: Experimental Aspect, Dis. Chest **30**:224-227 (Aug.) 1956.
4. Mayer, E., and Rappaport, I.: Bronchitis and Emphysema, J. A. M. A. **165**:1227-1230 (Nov. 9) 1957.
5. Rappaport, I., and Mayer, E.: Changing Forms and Causes of Pulmonary Insufficiency in Present Era of Medicine, J. A. M. A. **165**:431-436 (Oct. 5) 1957.
6. Björk, V. O., and Engström, C. G.: Treatment of Ventilatory Insufficiency After Pulmonary Resection with Tracheostomy and Prolonged Artificial Ventilation, J. Thoracic Surg. **30**:356-367 (Sept.) 1955; Treatment of Ventilatory Insufficiency by Tracheostomy and Artificial Ventilation: Study of 61 Thoracic Surgical Cases, ibid. **34**:228-241 (Aug.) 1957.

CLINICAL NOTES

CLINICAL USE OF ESTROGEN IN UTERINE PROLAPSE

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This report represents the findings in four patients with marked uterine procidentia who were treated nonsurgically with rather dramatic results: the reduction of uterine hernia after the oral and parenteral administration of estrogenic hormones.

Although uterine prolapse has been described in the newborn infant and in the nulliparous woman, it is most generally observed in the older multipara whose tissues have shown signs of loss of resiliency, as has been observed by Wilson.[1] Mengert[2] has rather conclusively pointed out anatomically that the bifid cardinal ligaments are the sole means of support in maintaining the uterus within its normal gynecologic confines. He has shown experimentally that only when the cardinal ligaments were cut, regardless of what other structures were intact, was there any appreciable descensus. The etiological factor, or factors, causing a change in the normal supporting mechanism of the cardinal ligaments is at present unknown, although many have theorized as to its cause. It has generally been an accepted fact that congenitally poor, inept, and inelastic supporting structures, found usually in most hernias, constitute the main reason for their production. A review follows of four patients, all of whom were several years past the menopause and had been complaining of uterine descensus for varying periods of time.

Report of Cases

Case 1.—A 66-year-old woman, referred because of her discomfort while ambulatory, stated that she felt that her "pelvic organs were all falling out." She had undergone the menopause 15 years previously and for the last 4 or 5 years had worn a pessary to support her uterus. At the time of examination, the pessary had been removed because of vaginal irritation.

Pelvic examination revealed a uterine prolapse, which brought the small eroded cervix out of the introitus on straining. The uterine corpus was atrophic but otherwise was not abnormal. A cystocele and a rectocele of appreciable size existed in conjunction with the prolapse. One child, aged 35 years at the time of writing, had been delivered uneventfully, and the postpartum course had been also uneventful. Slides prepared with used of Papanicolaou's stain revealed a low estrogenic level, no tumor cells, and very slight keratinization of any of the cells. The patient was advised to have the procidentia corrected by means of a vaginal plastic operation, to which she agreed. Surgery had to be postponed, because it was necessary for her to care for her sister, who was quite ill in a distant city. Her initial visit was in September, 1957. She returned after the death of her sister, complaining severely of the prolapse and other menopausal symptoms, such as hot flashes. Pelvic examination on Jan. 17, 1958, revealed the physical findings to be identical to those seen on her first visit, but with the addition of an excoriation of the skin about the vulva and the anus. It was thought wise to treat this patient for her menopausal symptoms prior to surgery. She was given conjugated estrogenic substances (Premarin), one 2.5-mg. tablet daily, and 20,000 units of estrone hypodermically. She returned on Jan. 24th, stating that her prolapse had disappeared and that her menopausal symptoms had left. Her pelvis was examined on Jan. 31st, and her statement of the disappearance of the uterine procidentia was corroborated, although a cystocele was still

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present to a lesser degree. The oral dosage of conjugated estrogenic substances was continued until April 11, 1958, at which time administration of conjugated estrogenic substances, 2.5 mg. every other day, was suggested. At the time of writing (May 30, 1958), there has been no return of her uterine procidentia.

Case 2.—A 65-year-old woman had worn a "doughnut" type of pessary for six or seven years because of marked uterine procidentia. Two children, aged 42 and 35 years at the time of writing, had been normal deliveries, and her postpartum courses had been normal. Her menopause had been at the age of 57. She had been a hospital patient on eight different occasions because of severe coronary heart disease. Pelvic examination on March 12, 1958, revealed a complete procidentia, a small atrophic uterine corpus, and an ulcerated cervix. Slides prepared with use of Papanicolaou's stain showed an over-all pattern of low estrogenic level, no tumor cells and very few keratinized cells. Inasmuch as this patient was such a poor surgical risk, it was thought best to treat her conservatively. Because such dramatic changes had been effected in case 1, the same therapy was instituted in this patient on her first visit. Examination on March 19, 1958, revealed external disappearance of the uterine corpus, with its return to its normal position, although a cystocele was present upon straining. The dosage of orally given estrogenic substance was reduced to every other day, principally because of breast soreness. This dosage has been maintained with no return of procidentia, although she has suffered another coronary attack.

Case 3.—A 72-year-old woman was first seen on Nov. 15, 1957. She had never been pregnant. She reported as a patient because of symptoms which were referable to uterine prolapse. Pelvic examination revealed a small cervix, normal in appearance, but on straining it protruded outside of the introitus about a centimeter. The uterine corpus was atrophic but otherwise not abnormal. The adnexal regions were also normal. A cystocele and rectocele were present. Urinalysis revealed the presence of sugar (4+). Her blood pressure was 160/80 mm. Hg. She also had a rather marked skin psoriasis on both the upper and lower extremities. A week later pelvic examination revealed the same findings, and she was referred to an internist for the control of her glycosuria. Her fasting blood sugar level was 128 mg.%. She returned on Feb. 27, 1958, with a prolapse which was complete, the entire uterine corpus and cervix being outside of the introitus. The patient was extremely uncomfortable. She was advised to have this condition corrected by surgical intervention, inasmuch as the present glycosuria had been corrected. She refused surgery and was again seen on April 2, 1958, at which time time she requested some means of therapy other than surgery. She was given the same dosage of orally administered conjugated estrogenic substances and parenterally injected estrone as was used in case 1 and 2.

She was seen 10 days later. The procidentia had disappeared, and the patient stated that after a week's therapy "she felt the uterus snap back into its normal position." Her initial dosage of estrogen has been maintained with no untoward results.

Case 4.—A 65-year-old woman had borne three children, with normal deliveries and postpartum courses. She now complained of a "dropping down sensation of her pelvic organs." Pelvic examination showed marked external hemorrhoids, cystocele, mild rectocele, and a uterine prolapse which brought a small normal-appearing cervix into view 2 cm. outside of the introitus. The uterine corpus was atrophic; the adnexal regions seemed normal. The patient's blood pressure was 136/74 mm. Hg, and the urinalysis was negative. She had previously been seen in 1956, because she had been told she had a "uterine tumor," and pelvic examination at that time had revealed a small fibroid at the fundus in an otherwise normal uterus. There was no evidence of prolapse, but a urethral caruncle and a mild cystocele were noted, although the latter had previously been repaired surgically.

Slides prepared with Papanicolaou's stain showed a low estrogenic level, with no keratinization of cells and no tumor cells. The patient was averse to any further surgical correction. She was put on a trial of conservative estrogenic therapy, as described in cases 1, 2, and 3. After one week's therapy, she stated that she felt "everything tightening up in the region of the pelvic organs," and she further stated that the procidentia no longer existed. Pelvic examination on May 5, 1958, showed the uterine corpus to be normally placed, although a cystocele still persisted.

Comment

No conclusions are being drawn from the findings in the four patients with uterine prolapse who received conjugated estrogens orally and parenterally, since they represent such a small clinical study. However, it is a striking clinical finding that in all four cases the uterine procidentia seems to have disappeared after the administration of estrogenic hormones. This may be just an accidental finding in the patients studied, as a similar happening cannot be found described in the literature.

If one were to conjecture as to the physiological reason for the correction of the uterine herniation, one would naturally surmise that some action had taken place within the supporting structures of the uterus, namely, the cardinal ligaments, thereby causing the uterus to be "pulled up" into its normal habitat. No unanimity of thought regarding the action of the estrogens upon uterine supporting tissue is expressed by endocrinologists, although Hamblen[3] states that lack of estrogens causes the ligaments of the uterus to involute, thereby losing much of their muscular constitution and strength, and they become thin fibrous bands and, hence, poor supporting tissue. It might be logical to expect that the restoration of normal estrogen levels might restore tone and strength to these vital uterine supports.

It is highly desirable that a much larger series be studied under similar clinical conditions and, in addition, an exhaustive physiological laboratory endeavor be assumed in order that the action of estrogens on uterine supporting tissues be determined.

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References

1. Wilson, J. M.: Pelvic Relaxations and Herniations, Publication 203, American Lecture Series, monograph in American Lectures in Gynecology and Obstetrics, edited by E. C. Hamblen, Springfield, Ill., Charles C Thomas, Publisher, 1954.

2. Mengert, W. F.: Mechanics of Uterine Support and Position: Factors Influencing Uterine Support: Experimental Study, Am. J. Obst. & Gynec. **31**:775-782 (May) 1936.

3. Hamblen, E. C.: Geriatric Gynecology, in Geriatric Medicine, edited by E. J. Stieglity, ed. 2, Philadelphia, W. B. Saunders Company, 1949, chap. 41, pp. 657-674.

TROCHANTERIC SYNDROME

CALCAREOUS AND NONCALCAREOUS TENDONITIS AND BURSITIS ABOUT THE TROCHANTER MAJOR

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The trochanteric syndrome frequently masquerades as sciatica. Tenderness and pain in the region of the trochanter major, often with irradiation of this pain down the posterolateral aspect of the thigh, constitute a well-defined syndrome. This symptom pattern is analogous to the so-called bursitis of the shoulder. The locus of pathology is in the abductor mechanism of the hip. The cause of the primary form is wear and tear, that of the secondary form the presence of foreign material, such as the end of a hip nail. Roentgenograms often reveal calcification in the tendons inserting into the trochanter. The condition is not rare. Local injection of hydrocortisone relieves the symptoms of the primary type.

Tendonitis, tenosynovitis, and bursitis about the glenohumeral joint are well known to the profession. These conditions are recognized and lumped together by the laity as bursitis of the shoulder. The analogous conditions in the region of the trochanter major are not so common or well known. However, they are not rare and are of importance in the differential diagnosis of hip and low back pain with and without irradiation.

The anatomic structures morbidly involved in the trochanteric syndrome can include the tendons of the gluteus maximus, gluteus medius, and gluteus minimus and the bursae separating those tendons from trochanter major. The principal bursa measures 2 to 4 by 4 to 6 cm. and lies between the gluteus maximus, as it passes to insert into the iliotibial band, and the trochanter major.[1]

As in the shoulder, one of the factors in the etiology of the primary trochanteric syndrome is the microtrauma of everyday use. Goldenberg and Leventhal[2] found an incidence of trochanteric calcification in 5.4% of 550 hip roentgenograms in patients over the age of 15 years. In the series reported by Spear and Lipscomb[1] the average age in patients with trochanteric bursitis without calcification was 39 years and the average age in those with calcification in the insertion of the gluteus medius tendon 49. In those persons with calcification in the tendon of the gluteus minimus the average age was 45. In the present group of 18 cases of primary trochanteric syndrome the average age was 46 years. Isolated trauma occurred immediately prior to the onset of symptoms in 22% of the cases. In Goldenberg and Leventhal's series of 25 cases with calcification there was a history of injury in 64%.[2] As in the analogous condition of the shoulder, it is felt that the principal factor in etiology is wear and tear rather than a single insult. The remembered injury makes the condition symptomatic. Trochanteric bursitis occurs secondary to operative intervention.

Pathology

The trochanteric syndrome arises from a varying pathology. Spear and Lipscomb[1] reported the syndrome in 67 cases In 24 of these there was a calcareous deposit near the trochanter. The present series showed calcification in 28%. Goldenberg and Leventhal[2] believe that the calcification occurs in the tendon of the gluteus medius, in a bursa between the tendon of the gluteus medius and the greater trochanter, and under the gluteus medius not connected with the trochanter. Actually, the common sites of calcification are in the tendon of the gluteus medius and minimus. Calcification in the tendon of the gluteus medius is seen at the upper half or third of the lateral facet of the trochanter major. This calcification varies in size from a fleck to an area of several centimeters (fig. 1). Calcification in the gluteus minimus is at the tip of the greater trochanter and usually is smaller than 1 cm. in diameter (fig. 2).

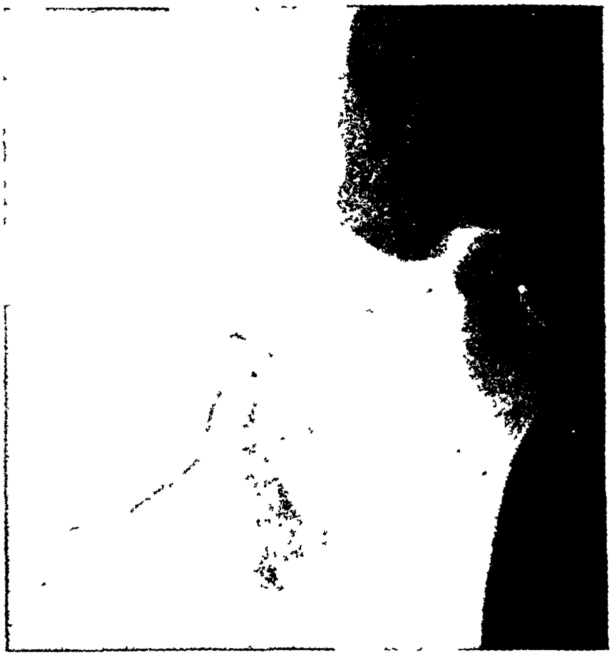

Fig 1.—Calcium at lateral facet of trochanter major, indicating calcific tendonitis in gluteus medius.

From the El Paso Orthopaedic Surgery Group.

The microscopic pathology in a calcific deposit is similar to that of calcareous tendonitis of the shoulder.[3] In the absence of calcification, there is a serous inflammation of the bursa between the trochanter and the gluteus maximus.

Trochanteric bursitis and calcareous tendonitis are not common; on the other hand they are not rare. Cloyd reported 80 cases of bursitis of the shoulder and 10 of the hip.[4] Spear and Lipscomb,[1] of the Mayo Clinic, reported 43 cases of bursitis and 24 cases of calcification seen in the period of 1935 to 1948. Goldenberg and Leventhal [2] reported calcification in 5.4% of 550 consecutive x-rays of the hip made of persons older than 15 years of age. The present series of 18 cases, diagnosed in the years 1955-1957, represent approximately 0.1% of patients seen in a private orthopedic practice. The literature to 1941 is reviewed by Schein.[5] Subsequent series of cases are presented by Spear and Lipscomb [1] and by Cloyd.[4]

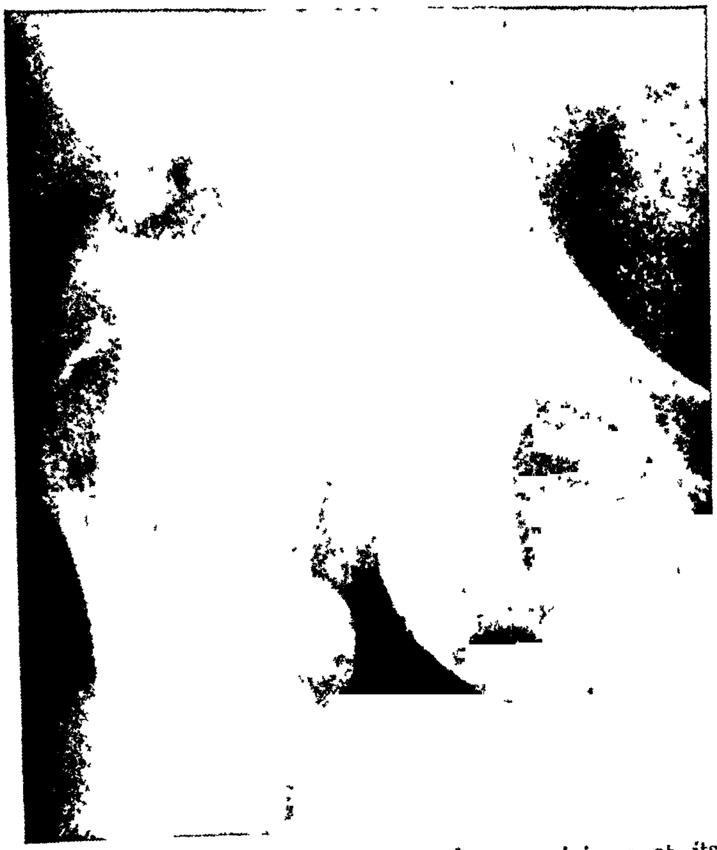

Fig. 2.—Calcareous deposit in gluteus minimus at its insertion into trochanter major.

Clinical Picture

The clinical picture of the trochanteric syndrome varies in degree but is fairly uniform as to type. The onset is frequently sudden, with pain on the lateral aspect of the hip irradiating down the posterolateral aspect of the thigh. This irradiation can simulate referred pain from the lumbosacral area. A gluteal limp is frequently present. Local tenderness in the region of the trochanter major is constant except in some isolated cases of calcification in the gluteus minimus tendon where the pathology is deep.[1] When the bursa underlying the gluteus maximus is involved, the hollow over the trochanter is sometimes obliterated. The site of the trochanter can be identified, even in obese persons, by this hollow (fig. 3). Those motions which relax the abductors of the hip tend to diminish the pain, whereas those which tighten these muscles increase it. Thus, passive internal rotation and abduction are painful, and passive abduction and external rotation are not. Flexion and extension of the hip do not cause severe pain. The most constant and useful finding is local tenderness over the trochanter major. In the presence of an active calcareous deposit, as in the case of calcareous tendonitis of the shoulder, a low-grade fever and leukocytosis may be present.

Roentgenographic study demonstrates the absence of intra-articular pathology except when this is an incidental finding. Some of the patients of this age group will show hypertrophic changes. Roentgenographic examination may show a primary condition, such as a hip nail causing a secondary bursitis. Calcifications of the tendons of the gluteus medius or minimus may be seen (fig. 1 and 2).

The treatment of the primary trochanteric syndrome follows that used for its analogue in the shoulder. Roentgenotherapy, diathermy, puncture, and open surgical removal of calcium when this is present have been used with good results.[6] In this series of 18 cases, local injection of hydrocortisone acetate has resulted in complete relief of symptoms in all instances. The technique employed is that of infiltration of all tender areas with a local anesthetic followed by infiltration of these areas by hydrocortisone in doses of 25 to 100 mg. The patient should be cautioned that the pain may be temporarily aggravated and that more than one injection may be necessary. Trochanteric bursitis secondary to the presence of extraneous material should be treated by removal of the foreign substances.

Fig. 3.—Hollow on lateral aspect of hip, indicating tip of trochanter major.

Summary

"Bursitis" of the shoulder has its analogue about the hip. It is not uncommon and can result in a train of clinical signs and symptoms identified as the trochanteric syndrome. This syndrome is sometimes confused with referred pain from the lumbosacral area. It is effectively treated by local injections of hydrocortisone.

520 Montana Ave.

References

1. Spear, I. M., and Lipscomb, P. R.: Noninfectious *Trochanteric Bursitis and Peritendonitis,* S. Clin. North America **32:**1217-1224 (Aug.) 1952.

2. Goldenberg, R. R., and Leventhal, G. S.: Supratrochanteric Calcification, J. Bone & Joint Surg. **18:**205-211 (Jan.) 1936.

3. Codman, E. A.: Shoulder: Rupture of Supraspinatus Tendon and Other Lesions in or About the Subacromial Bursa, Boston, Thomas Todd Company, 1934. Lecocq, E.: *Peritrochanteric Bursitis:* Report of Case, J. Bone & Joint Surg. **13:**872-873 (Oct.) 1931.

4. Cloyd, W. L.: Bursitis of Hip, Mississippi Valley M. J. **76:**219-220 (Nov.) 1954.

5. Schein, A. M., and Lehmann, O.: Acute Trochanteric Bursitis with Calcification, Surgery **9:**771-779 (May) 1941.

6. Smith, F. B.: Bursitis Other Than in Shoulder, Portland Clin. Bull. **10:**79-88 (March) 1957. References 1, 2, 3, 4, and 5.

SIMPLE SURGICAL TREATMENT OF SPONTANEOUS PNEUMOTHORAX BY USE OF A PLASTIC NEEDLE

Warren P. Knuth, M.D., Kermit J. Wright, M.D.
and
Vilibald A. Jenko, M.D., Fort Harrison, Mont.

When the physician encounters a patient with spontaneous pneumothorax, several courses of therapy are available. For purposes of simplification it may be stated that the two general methods are the medical or "watchful expectancy" program and the surgical or aspiration method. Whereas 30 years ago treatment was principally limited to medical management, it has become increasingly more common to utilize the aspiration method. There are several reasons for this change, which are as follows: (1) earlier reexpansion of lung, (2) immediate relief of symptoms, (3) lower incidence of complications, (4) shorter period of hospitalization, and (5) an earlier return to economic productivity. It has been customary to refer to the medical or nonaspiration program as the conservative program. We are in agreement with the principles expressed in the paper by Campbell and Varco[1] in which they state that the medical management is "scarcely conservative of the patient's comfort, convenience, finances or predisposition to serious complication."

In spite of the evidence favoring early surgical management, an appreciable number of patients with spontaneous pneumothorax are not treated by early aspiration. The reasons for this are varied, but it is believed that if the procedure could be made both simple and completely safe this method would be universally adopted. The device to be described is believed to fulfill these requirements.

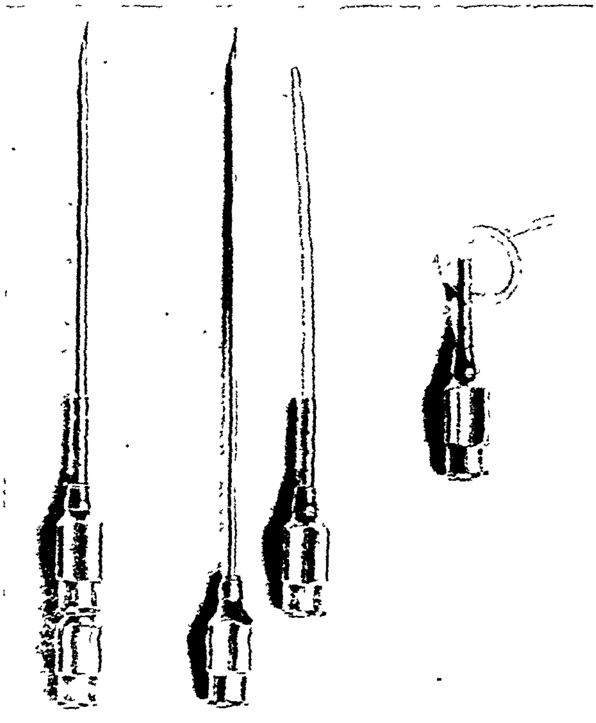

Fig. 1.—Plastic needle, assembled unit on left and component parts in middle. Note degree of torsion permissible without significant luminal obstruction.

The patient usually presents himself with the complaint of chest pain, dyspnea, or cough. Occasionally there may be no complaints whatever and

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From the Department of Surgery, Veterans Administration Hospital.

the diagnosis is established on the basis of routine physical examination or survey chest x-ray. If the degree of collapse is 15% or less, surgical management is not indicated. When a greater degree of pneumothorax exists, the following method of treatment is employed.

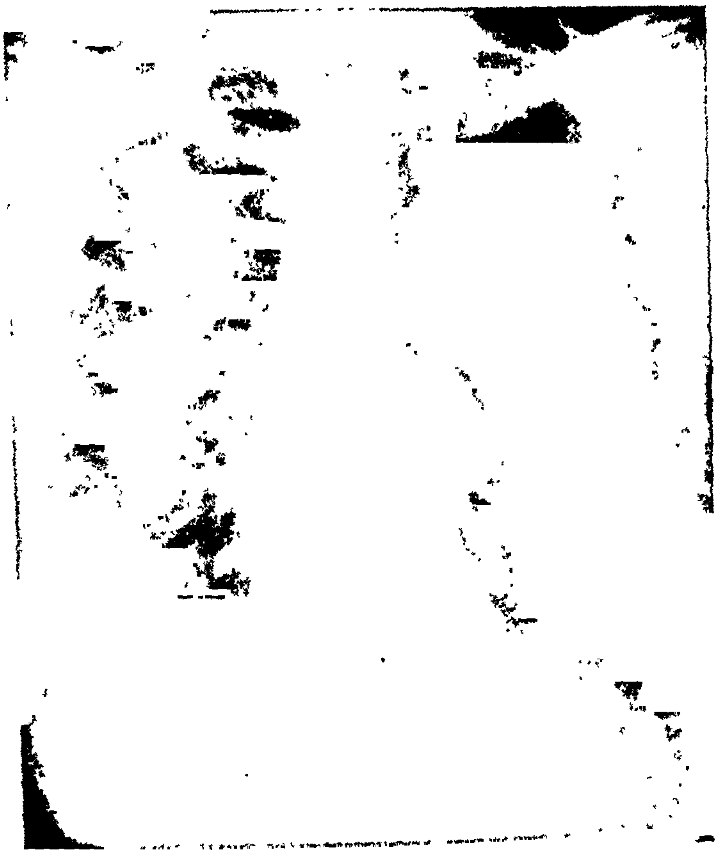


Fig. 2.—Chest roentgenogram of healthy young adult with spontaneous pneumothorax.

Method

The plastic needle to be used is shown in figure 1. The needle is shown in its assembled state on the left and disassembled in the middle; the needle on the right shows the degree of torsion which can occur without significant obstruction of the lumen. The patient is placed in the dorsal recumbent position and the anterolateral part of the chest wall is cleansed with thimersol (Merthiolate) or a similar bacteriocidal agent. The general principles of asepsis are observed. The second interspace near the midclavicular line is infiltrated with 1% procaine hydrochloride (Novocain), and the plastic needle which has been kept in a sterile pack is then introduced into the pleural cavity. A characteristic sensation is noted when the needle punctures the pleura. The needle is then advanced several millimeters, and the metallic inner portion is withdrawn the same distance. This procedure is continued until the entire plastic portion is within the pleural cavity and the metallic portion has been completely removed. Aspiration of air is then begun either with use of a 50-cc. syringe attached to a three-way stopcock or by attachment of the needle to an air pump set at minus 10 cm. of water. The air is withdrawn slowly to prevent paroxysms of coughing due to tracheal and mediastinal shift and reexpansion of lung parenchyma. In the event of persistent coughing, 1/6th grain (10 mg.) of morphine sulfate should be administered intravenously to depres the cough reflex. On complete reexpansion of th lung, the base of the needle is taped to the ches wall, and negative pressure is maintained for 2 hours after all air leakage has ceased. Some autho have recommended the use of water seal drainag Undoubtedly the results with its use are complete satisfactory. It has been our practice to use neg tive pressure systems with pumps, and the resu thus far have been excellent. The use of an pump does *not* encourage a persistent pleural leak, contrary to the opinion expressed by some. Figures 2 and 3 show the typical pretreatment and post-treatment chest roentgenograms which are seen after treatment in the manner described.

Since the original work with the use of the plastic needle in treatment of pneumothorax, we have been impressed with its usefulness in diagnostic and therapeutic puncture of other serous cavities. Thus, pericardiocentesis and abdominal pericentesis can be performed with a further degree of safety. In addition, for those who treat hydrocele by aspiration, traumatic orchitis can be avoided by use of this device.

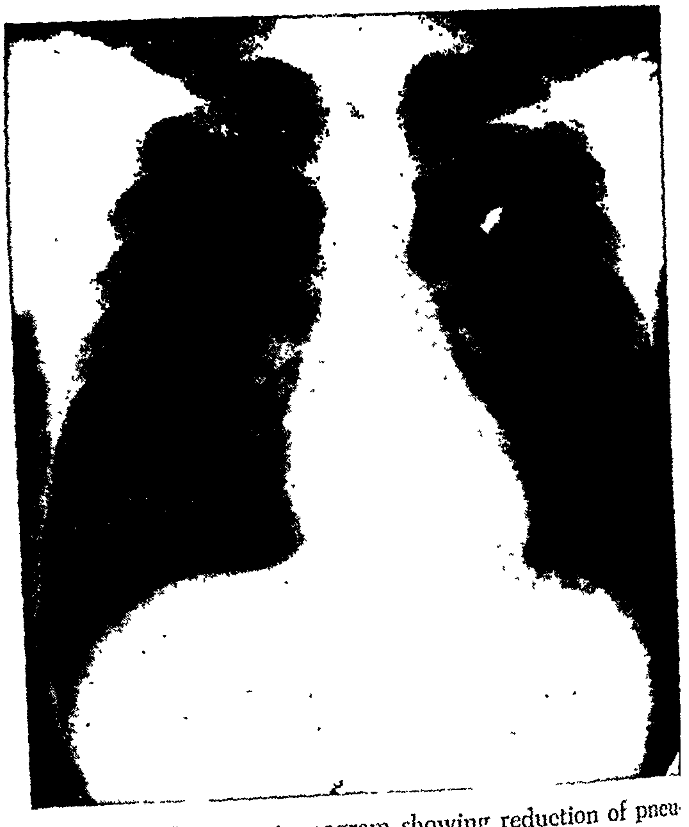


Fig. 3.—Chest roentgenogram showing reduction of pneumothorax and position of plastic needle.

James H. Rose Jr., Mrs. Martha Hassell, and Velma L. Hofferbert supplied technical assistance in this study. T. E. Gauthier, Rochester Products Company, Rochester, Minn., supplied information on the plastic needle and furnished figure 1.

Reference

1. Campbell, G. S., and Varco, R. L.: Management of Spontaneous Pneumothorax, Journal-Lancet **77**:443-445 (Nov.) 1957.

PRESERVATION OF RENAL FUNCTION DURING PARTIAL NEPHRECTOMY

USE OF RUBBER BAND TOURNIQUET FOR HEMOSTASIS

Willard E. Goodwin, M.D.
and
Henry M. Thelen, M.D., Los Angeles

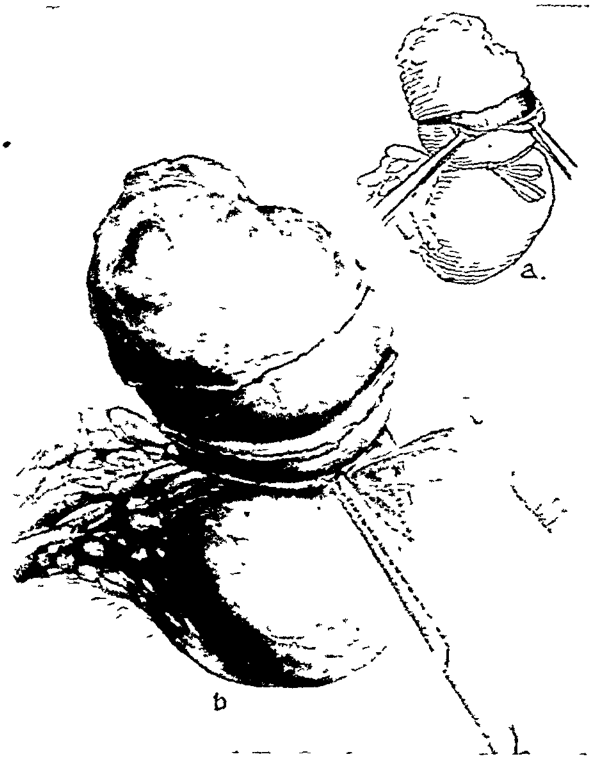
Murphy and Best,[1] in 1957, reviewed the literature concerning partial nephrectomy. In their concise and useful paper they recommended simple guillotine amputation and presented convincing evidence that the least damage is done to the kidney with this technique. They described hemostasis as secured during the resection by placement of a Crafoord clamp on the vascular pedicle. One of us (W. E. G.) has previously reported use of a *small bulldog clamp placed on the renal artery* alone during biopsy or partial nephrectomy.[2] Recently, we have had occasion to use a different technique for hemostasis during partial resection and have found it simple and effective.

The kidney is well mobilized, allowing access to all of its surfaces. The area to be resected is identified, and the renal capsule is stripped from the area which is to be removed. At a point on the normal kidney, below the area of stripping, a rubber band, ¼ in. wide, is placed around the whole kidney as a tourniquet and is held in place with a clamp. This allows perfect hemostasis and good access to the area to be resected. The amputation is then done as described by Murphy and Best[1] (see figure). Hemostatic sutures are placed under direct vision. The capsule is closed over the wound. The rubber band tourniquet is released, and the wound is carefully inspected for evidence of any excess bleeding.

This simple technique is useful in resection or nephrotomy of either pole of the kidney. It is not applicable to resection or biopsy of the central portion of the kidney, in which case we feel that the use of a bulldog clamp placed on the isolated renal artery is the method of choice. Although we have not yet used this type of tourniquet for hemostasis in dividing the isthmus of a horseshoe kidney, it would seem ideally suited to this situation with the application of two tourniquets and incision in the isthmus of the horseshoe kidney between them.

The use of a tourniquet in this manner to achieve renal hemostasis has the added advantage of allowing continued circulation to the remaining normal kidney tissue. It could also be applied in the rare situation when partial resection of a solitary kidney is necessary for renal neoplasm.[3]

We have employed this technique in two cases with excellent results, and some of our associates have also used it with satisfaction after learning of the method from us. On two occasions a colleague had difficulty with complete hemostasis because the rubber band was too thin and was not pulled tightly enough. The rubber band tourniquet should be a heavy, ¼-in., strong band, and it should be applied tightly enough to produce blanching of the kidney. When properly used, it provides a bloodless field and minimal trauma and is easy and practical in application.



Rubber band tourniquet, used to achieve local hemostasis without impairment of blood supply to rest of kidney during partial nephrectomy.

References

1. Murphy, J. J., and Best, R.: Healing of Renal Wounds: I. Partial Nephrectomy, J. Urol. 78:504-510 (Nov.) 1957.
2. Goodwin, W. E., in Urol. Surv. 2:238-239 (June) 1952, abstract of Weyrauch, H. M.; Wanless, H. L.; Goebel, J. L.; and Scott, K. G.: Biopsy of Kidney for Suspected Neoplasm, J. Urol. 67:60-85 (Jan.) 1952.
3. Colston, J. A. C.: Operation for Tumor in Solitary Kidney, read before the Seventh Congress of the Pan-Pacific Surgical Association, Honolulu, Nov. 20, 1957.

From the Department of Surgery, Division of Urology, University of California Medical Center, and Wadsworth General Hospital, Veterans Administration Center.

SLIDE LATEX FIXATION TEST

A SIMPLE SCREENING METHOD FOR THE DIAGNOSIS OF RHEUMATOID ARTHRITIS

Jacques M. Singer, M.D.
and
Charles M. Plotz, M.D., New York

The use of uniform size polystyrene latex particles as substitutes for red blood cells in the serologic test for rheumatoid arthritis has been reported on previously.[1] These biologically inert particles might agglutinate spontaneously without added gamma globulin in the presence of strongly positive rheumatoid serum, but only in a low titer.[2] When serums were fractionated by the addition of 1.64 M ammonium sulfate, 90% of 250 patients with rheumatoid arthritis showed positive results in a one-tube technique with use of the patient's own gamma globulin.[2a] As a further simplification, Bozicevich and co-workers [3] have described a slide method using serum and bentonite particles. A study has now been made which has resulted in a simple screening test which is highly sensitive for the diagnosis of rheumatoid arthritis and suitable for epidemiologic study, as well as for clinical and office use.

Materials and Methods

A stock solution of a suspension of polystyrene latex particles of uniform size, 0.81 μ in diameter, is made by diluting the original suspension with distilled water. Dilution is continued until 0.1 ml., when mixed with 10 ml. of water, matches a light transmission of 5% in a Coleman Universal spectrophotometer (model 11 or 14) in a square cuvette, 13 by 13 by 100 mm., at 650 mμ with a red filter. This stock solution may be stored in the refrigerator for several months.

One per cent and 2% solutions of eosin are prepared with distilled water. Three pipets, with a serologic capacity of 0.2 ml. with 0.01-ml. subdivisions, or dropping bottles with glass pipets calibrated to deliver 0.05 ml. of liquid in one drop, are used, one containing the stock latex particles and one each for the 1% and 2% eosin solutions. Wooden toothpicks and ordinary microscope slides are also needed.

First, 0.2 ml. (three to four drops) of fingertip blood (or 0.05 ml. of serum) are placed on each of two slides. One drop (0.05 ml.) of 1% eosin is added to the blood on one slide and one drop of 2% eosin to the other. Both are then mixed thoroughly with a toothpick. Two drops (0.01 ml.) of stock latex solution are added to each slide, they are again mixed, and the resulting suspension is spread over the slides by tilting them back and forth.

With use of natural or artificial daylight and a dark background, the slides are then tilted back and forth with the fingers and observed for clumping. In positive tests, this will appear in one to three minutes as a fine granular agglutination. Negative tests show a simple homogeneous reddish suspension. No magnification is required.

The order of addition should be carefully followed—blood, eosin, then latex—since, if latex is added before the eosin, nonspecific agglutination may occur. The concentration of eosin is critical. If the concentration of eosin is well below 1%, a much greater incidence of false agglutination is observed, and, if eosin is eliminated altogether, 85% of all serums will show nonspecific agglutination. A positive test is one in which agglutination occurs on either slide.

Comparison of Positive Results with Tube and Eosin Slide Latex Fixation Tests in 738 Patients*

	Latex Fixation Test					
			Eosin Slide Method			
	Tube Method*		1%		2%	
Clinical Group, No. of Patients	No.	%	No.	%	No.	%
Rheumatoid arthritis, 120	108	90.0	110	91.6	104	86.6
Osteoarthritis and other arthritis, 180	5	2.7	8	4.4	5	2.7
Lupus erythematosus, 38	5	13.1	6	15.7	4	10.5
Other nonarthritic disease, 300	9	3.0	26	8.6	8	2.6
Normal, 100	2	2.0	2	2.0	1	1.0

* With use of patient's own gamma globulin.

Results

A total of 120 patients with rheumatoid arthritis, 38 patients with disseminated lupus erythematosus, 180 patients with osteoarthritis and other forms of arthritis, 300 patients with nonarthritic diseases, and 100 normal controls were tested. The results are summarized in the table. This table compares the results observed with the one-tube latex fixation test with use of the patient's own gamma globulin and the results with the 1% and 2% eosin slide test. There is close correlation in all groups. As may be observed from the table, with use of 2% eosin, the incidence of positive slide tests in patients with rheumatoid arthritis is reduced from 91.6%, observed with 1% eosin, to 86.6%. In nonarthritic disease, however, the incidence of positive results is reduced from 8.6%, tested with 1% eosin,

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From the Arthritis Clinic and the departments of medicine and microbiology, Mount Sinai Hospital. Fellow of the Arthritis and Rheumatism Foundation (Dr. Singer), and Director of Arthritis Clinics, Mount Sinai and Kings County hospitals (Dr. Plotz).

to 2.6% when tested with 2% eosin. If the increased sensitivity is important, as in epidemiologic study, the slide test with 1% eosin might be more useful. On the other hand, the 2% eosin test gives fewer positive reactions in cases of nonrheumatoid arthritis.

Summary

A new simplified screening slide agglutination test for the serologic diagnosis of rheumatoid arthritis consists of the addition to fingertip blood or serum of an eosin solution and latex particles. The resultant agglutination in positive tests is read easily and quickly with the naked eyes. While 86.6% of 120 patients with rheumatoid arthritis gave positive results with the 2% eosin slide agglutination method, only 2.7% of serums of 180 patients with other arthritic disease, 2.6% of 300 patients with nonarthritic diseases, and 1% of 100 normal controls were found to show positive findings.

860 Fifth Ave. (Dr. Plotz).

The polystyrene latex particles used in this study were manufactured by the Dow Chemical Company, Midland, Mich., and distributed by the Arthritis and Rheumatism Foundation, New York.

This study was aided, in part, by grants from the National Institute of Arthritis and Metabolic Disease, National Institutes of Health, the State of New York chapter of the Arthritis and Rheumatism Foundation, and the Fribourg Fund.

References

1. (*a*) Singer, J. M., and Plotz, C. M.: Latex Fixation Test: I. Application to Serologic Diagnosis of Rheumatoid Arthritis, Am. J. Med. **21**:888-892 (Dec.) 1956. (*b*) Plotz, C. M., and Singer, J. M.: Latex Fixation Test: II. Results in Rheumatoid Arthritis, ibid. **21**:893-896 (Dec.) 1956. (*c*) Rheins, M. S.; McCoy, F. W.; Burrell, R. G.; and Buehler, E. V.: Modification of Latex Fixation Test for Study of Rheumatoid Arthritis, J. Lab. & Clin. Med. **30**:113-118 (July) 1957. (*d*) Thomas, J. W., and others: Latex Fixation Test in Rheumatoid Arthritis, Canad. M. A. J. **76**:621-623 (April 15) 1957. (*e*) Rothermich, N. O., and Philips, V. K.: Serologic Diagnosis of Rheumatoid Arthritis, J. A. M. A. **164**:1999-2004 (Aug. 31) 1957. (*f*) Gofton, J. P.; Thomas, J. W.; and Robinson, H. S.: Serologic Reactions to Polysaccharides in Rheumatoid Arthritis, Canad. M. A. J. **77**:1098-1102 (Dec. 15) 1957.

2. (*a*) Singer, J. M., and Plotz, C. M.: Latex Fixation Test for Rheumatoid Arthritis Using Patients Own Gamma Globulin, Arthritis ad Rheumatism 1:142-146 (April) 1958. (*b*) Reference 1*a* and *f*.

3. Bozicevich, J.; Bunim, J. J.; Freund, J.; and Ward, S. B.: Bentonite Flocculation Test for Rheumatoid Arthritis, Proc. Soc. Exper. Biol. & Med. **97**:180-183 (Jan.) 1958.

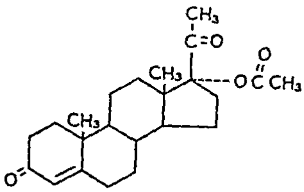
COUNCIL ON DRUGS

NEW AND NONOFFICIAL DRUGS

Monographs and supplemental statements on drugs described here and in subsequent editions of New and Nonofficial Drugs are based on the evaluation of available scientific data and reports of investigations.

H. D. Kautz, M.D., *Secretary.*

Hydroxyprogesterone Acetate.—17α-Hydroxyprogesterone acetate.—The structural formula of hydroxyprogesterone acetate may be represented as follows:



Actions and Uses.—Hydroxyprogesterone acetate is an esterified derivative of hydroxyprogesterone. In contrast to progesterone, which is virtually inactive by the oral route, hydroxyprogesterone acetate causes pronounced progestational effects after oral administration. Typical effects include production of secretory changes in an estrogen-primed endometrium, luteal changes in exfoliated vaginal epithelial cells, suppression of the formation of fern-like patterns in the cervical mucus (arborization), increases in basal body temperature, and induction of endometrial withdrawal bleeding after endogenous or exogenous estrogenic stimulation. On the basis of both laboratory and clinical studies, hydroxyprogesterone acetate appears to be considerably more potent as a progestogen than are equal amounts of orally given ethisterone. Its onset and duration of action are approximately the same as with parenterally administered progesterone; withdrawal bleeding from an estrogen-primed endometrium generally occurs within two to three days after the oral administration of about 100 mg. The drug produces only minimal estrogenic responses and shows no androgenic activity.

Hydroxyprogesterone acetate is useful in all conditions in which parenterally administered progesterone or hydroxyprogesterone caproate is indicated. (See the monograph on hydroxyprogesterone caproate in New and Nonofficial Drugs.) Thus, it may be given for the treatment of primary or secondary amenorrhea, for functional uterine bleeding in patients with diagnosed benign endometrial hyperplasia, and in cases of infertility believed to be due to inadequate corpus luteum function. The drug may also be employed during the first and second trimesters in patients with a history of habitual abortion. There is inadequate evidence at hand to justify the routine employment of hydroxyprogesterone acetate, or any other progestogen, for the treatment of dysmenorrhea or premenstrual tension.

Hydroxyprogesterone acetate appears to be well tolerated. In the clinical studies to date, no significant untoward effects have been reported.

Dosage.—Hydroxyprogesterone acetate is administered orally. For amenorrhea, functional uterine bleeding, and infertility, the usual dosage ranges from 25 to 50 mg. per day. This amount is taken either for 5 successive days beginning on the 21st day of the menstrual cycle or for 20 successive days beginning on the 5th day of the menstrual cycle. Supplemental estrogen therapy may also be instituted in patients who fail to produce adequate amounts of endogenous estrogen. The proposed dosage for habitual abortion is 200 to 400 mg. daily until fetal viability is evident.

Preparations: tablets 25 mg. and 50 mg.

Applicable commercial name: Prodox.

The Upjohn Company cooperated by furnishing scientific data to aid in the evaluation of hydroxyprogesterone acetate.

Influenza Virus Vaccine, Monovalent, Type A (Asian Strain).—A sterile suspension of formaldehyde-killed influenza virus, type A, Asian strain, recovered from the extraembryonic fluids of chick embryos infected with this virus. The product complies with the requirements of the National Institutes of Health of the United States Public Health Service. Influenza virus vaccine, Asian strain, monovalent, has been standardized to date in terms of chicken-cell agglutination (CCA) titer. Most lots of vaccine released by the NIH prior to Dec. 1, 1957, contained 200 CCA units per cubic centimeter, but all lots after that date will contain 400 CCA units per cubic centimeter.

Actions and Uses.—Influenza virus vaccine, monovalent, is designed solely for prophylaxis against epidemic and endemic infections caused by the type A, Asian strain, of influenza virus. A rise in hemagglutination-inhibition antibody titers against Asian strain influenza virus has been demonstrated after injection of the vaccine into both man and animals. In man, the rise is apparent within one week after subcutaneous injection, and maximal antibody titers appear to be achieved by the end of the second week. Some recent evidence indicates that the more potent vaccine containing 400 CCA units may elicit antibody responses comparable to those observed in patients who have recovered from Asian influenza. Hemagglutination-inhibition antibody titers produced by vaccines containing other strains of influenza virus have been found to be correlated with the development of immunity against the disease caused by those strains. As yet, clinical experience with the new Asian strain is not sufficient to permit such a correlation. In a single small series of patients, unvaccinated and vaccinated adult volunteers were inoculated with live Asian strain influenza virus; 78% of the unvaccinated placebo group became ill with influenza, whereas 44% of the vaccinated group developed symptoms of this disease. These preliminary results give some indication that the vaccine provides moderate but incomplete, protection against Asian influenza. At the present time, therefore, it can only be assumed that the present vaccine may be similar to other influenza virus vaccines which have given variable protection, up to 70% in some instances. The period of protection provided by the new vaccine is unknown but, on the basis of experience with other influenza vaccines, can be expected to last for about one year. No significant effect on Asian influenza antibody response, either adverse or beneficial, has been demonstrated when the Asian strain component is administered in combination with the old polyvalent A,A′, and B vaccine.

Since the virus for the vaccine is grown in the extraembryonic fluid of chicken eggs, administration of vaccine is absolutely contraindicated in persons with a history of hypersensitivity to egg, chicken, or chicken feathers. Local reactions to the vaccine are common and include a transient stinging sensation at the site of injection immediately after administration, usually with local redness, induration, and tenderness during the succeeding 12 to 24 hours. A systemic type of reaction characterized by fever, malaise, backache, and headache occurs in an appreciable proportion of patients to whom the vaccine is given subcutaneously; the incidence is considerably lower if the vaccine is administered intracutaneously. Such systemic reactions are usually not serious and rarely incapacitate the patient for longer than one day.

Dosage.—Influenza virus vaccine, monovalent, type A (Asian strain) is administered subcutaneously. The dose by this route is 1 cc. for adults and 0.5 cc. for children between the ages of 5 and 12 years. For children between the ages of 3 months and 5 years, the American Academy of Pediatrics has suggested a dose of 0.1 cc. given subcutaneously or intracutaneously. The academy has also suggested that the foregoing doses for infants or children be repeated within one or two weeks.

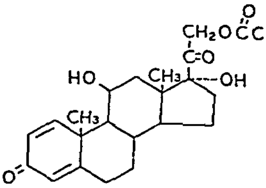
Vaccination of adults by two intracutaneous injections of 0.1 cc. separated by an interval of three to four weeks has been suggested. There is some evidence to indicate that the antibody response after the intracutaneous injection of 0.1 cc. is appreciable, but not as good as that which follows subcutaneous injection of 1 cc. Such a regimen reduces the amount of vaccine needed and, no doubt, is attended by a reduced incidence of systemic reactions. However, it is difficult to predict its clinical efficacy since, in the past, all other field evaluations of influenza vaccines have been carried out with the drug administered by the subcutaneous route.

Preparations: suspension (injection) 5 cc. and 10 cc.

Applicable commercial name: *Influenza Virus Vaccine, Monovalent, Type A (Asian Strain).*

Eli Lilly and Company; The National Drug Company; and Pitman-Moore Company, Division of Allied Laboratories, Inc., cooperated by furnishing scientific data to aid in the evaluation of influenza virus vaccine, monovalent, type A (Asian strain).

Prednisolone Acetate.—Prednisolone-21-acetate.—The structural formula of prednisolone acetate may be represented as follows:



Actions and Uses.—Prednisolone acetate has the same actions, uses, and limitations as prednisolone. The acetate ester is relatively nonirritating to the tissues and is therefore suitable for intramuscular injection. It may be used in those situations in which oral therapy with prednisolone is not feasible. The drug is also a suitable substitute for orally administered prednisolone in patients undergoing surgery who require maintenance glucocorticoid therapy. (See the monograph on prednisolone in New and Nonofficial Drugs.)

Dosage.—Prednisolone acetate is administered by the intramuscular route. Dosage is expressed in terms of the parent drug and is the same as for orally administered prednisolone.

Preparations: suspension (injection, aqueous) 125 mg. in 5 cc.

Applicable commercial name: Sterane.

Pfizer Laboratories, Division of Chas. Pfizer & Company, Inc., cooperated by furnishing scientific data to aid in the evaluation of prednisolone acetate.

Use of Poliomyelitis Immune Globulin (Human) for Oral Herpetiform Lesions

The Council has evaluated the use of poliomyelitis immune globulin (human) for the management of recurrent vesicular lesions of the mouth. Because this preparation of gamma globulin has been useful for the attenuation or prevention of such virus diseases as poliomyelitis, measles, and infectious hepatitis, it has been tried also for the treatment of certain oral lesions believed to be viral in origin. These lesions are collectively designated as oral herpetiform lesions, since the etiology of all types has not been proved to be herpes simplex. This designation includes herpetic gingivostomatitis, herpetic ulcers, herpes labialis (cold sore, fever blister), and aphthous stomatitis (canker sore, aphthous ulcer).

The clinical evaluation of poliomyelitis immune globulin (human) used for this purpose is based upon a few individual case reports taken from a relatively small number of patients to whom the drug was administered for short periods of time. In some cases, therapy was begun after the original lesions had undergone considerable secondary infection, thus complicating the diagnosis and interpretation of results of therapy. Although controlled data are lacking, some physicians and dentists believe that some, but not all, patients are benefited by such therapy; other investigators have been unable to demonstrate beneficial effects. The drug does not appear to have any appreciable effect on lesions already present. In favorable cases, it seems to halt the formation of new lesions. The duration of immunity thus produced is unknown. The results obtained thus far warrant further study under well-controlled conditions. At the present time, however, the use of poliomyelitis immune globulin (human) for the treatment of oral herpetiform lesions is considered experimental.

In the clinical trials to date, dosage appears to be determined on an empirical basis. Equally satisfactory results have been reported with doses ranging from 2.5 cc. every three or four days to as much as 20 cc. every day for six weeks in cases of Behcet's syndrome. As a general rule, it is suggested that 3 to 10 cc. be injected intramuscularly once or twice a week. Subsequent dosage and intervals between injections should be governed by individual response. Further studies are needed, however, to establish both the effect of poliomyelitis immune globulin (human) and its optimal dosage.

The Council voted to expand New and Nonofficial Drugs to describe the use of poliomyelitis immune globulin (human) for oral herpetiform lesions.

Merck Sharp & Dohme Research Laboratories, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of this additional use of poliomyelitis immune globulin (human).

Ristocetin.—An antibiotic produced by the fermentation of Nocardia lurida, a species of Actinomycetes. The antibiotic has two components, ristocetin A and ristocetin B, the chemistry of which is not completely known. The commercial product is a lyophilized preparation representing a mixture of ristocetins A and B.

Actions and Uses.—Ristocetin is an antibiotic substance active against pathogenic gram-positive cocci. It is active in vitro against the following organisms (listed in order of decreasing susceptibility): streptococci, enterococci, pneumococci, and staphylococci. It also shows in vitro activity against mycobacteria, although it is not recommended for use in human tuberculosis infections at the present time, since clinical evidence of its efficacy is lacking.

The principal therapeutic tests of the efficacy of ristocetin have been in the treatment of severe staphylococcic and enterococcic infections. Since the drug is not as active, as a rule, as penicillin and certain other antibiotics, and since it must be given intravenously, it is neither rational nor practical to employ ristocetin for treating staphylococcic infections unless certain criteria have been met. Accurate bacteriological identification of staphylococci should be made prior to initiating therapy. Sensitivity tests should be done to establish not only the sensitivity of the bacteria to ristocetin but also their resistance to such other agents as penicillin, the tetracyclines, streptomycin, erythromycin, chloramphenicol, and perhaps novobiocin and oleandomycin. In some patients treated for severe staphylococcic infections, ristocetin has been successful in arresting infections due to strains of the organism that have resisted therapy with all other available agents. Thus, the drug shows promise as a valuable antistaphylococcic agent which may be lifesaving in cases in which organismal resistance precludes the use of other antibiotics.

Ristocetin is also of value for the treatment of enterococcic infections, particularly endocarditis caused by that organism. In view of the marked sensitivity of enterococci to the drug and the frequency with which these organisms are resistant to other antibiotics, ristocetin may ultimately prove to be a drug of choice for the initial therapy of serious infections due to enterococci resistant to other antimicrobial agents.

Because ristocetin inhibits, in vitro, the growth of pneumococci and beta-hemolytic streptococci (group A), it has been proposed for use in infections caused by these organisms. Limited experience with such infections indicates that the drug is capable of effecting a cure. Since, however, other antibiotic agents (chiefly penicillin and the tetracyclines) are generally better tolerated, are easier to administer, and are effective, and since bacterial resistance to the other agents rarely, if ever, develops, there is practically no justification for the use of ristocetin in pneumococcic or beta-hemolytic streptococcic (group A) infections.

To date, bacterial (principally staphylococcic) resistance to ristocetin apparently has not developed in vitro or in vivo to the same degree as with certain other antibiotics. It is not yet known whether resistant forms will appear as the clinical use of the drug becomes more extensive. Cross resistance to other antibiotics has not been reported.

Ristocetin produces a number of side-effects, some of which may prove to be serious. Significant depression in white blood cell counts, with relative neutropenia, has been reported in about 4% of cases studied to date. Abnormal bone marrow changes or granulocytopenia have not yet been observed, but physicians should be alert to their possible occurrence. Peripheral blood cell counts, including a differential leukocyte count, should be done at frequent intervals and therapy discontinued immediately if the total white blood cell count falls below 5,000 per cubic millimeter or the differential neutrophil count falls below 50%. In some patients who subsequently develop leukopenia, eosinophilia is observed as an early sign.

Ristocetin is irritating to the intima of veins, and chemical thrombophlebitis can be produced if the drug is administered in too high a concentration. Hence, only diluted solutions are suitable for intravenous infusion, and care should be taken to avoid accidental extravasation after displacement of the infusion needle. Drug fever, sometimes accompanied by a skin eruption, has been observed in a few patients after several days of therapy with ristocetin. This has subsided promptly upon discontinuation of medication. Diarrhea may occur occasionally in patients receiving high doses. The drug can also elicit occasional allergic responses, generally skin rashes either at the site of infusion or, more commonly, a generalized eruption. No anaphylactic reactions have been reported. Although the drug has not been reported to cause toxic effects on the kidneys, periodic urinalyses are considered advisable.

Dosage.—Ristocetin should be administered only by the intravenous route, because it is inadequately absorbed when given orally and because it is irritating to the tissues when given extravascularly. The drug is best administered by the drip technique. For this purpose, dry, sterile powder is dissolved in a sufficient amount of 5% dextrose solution to make a 0.2% solution (2 mg. per cubic centimeter). The required volume of this diluted solution is then administered by the intravenous route over a period of 35 to 45 minutes. Occasionally, more concentrated solutions have been given by direct intravenous injection. The maximum tolerated concentration of such solutions is 1.25% (12.5 mg. per cubic centimeter), and the maximum rate of injection is 2 cc. (25 mg.) per minute.

For staphylococcic infections, the usual total daily dose is 25 to 50 mg. per kilogram of body weight. In endocarditis due to resistant strains of staphylococci, or when vegetations or abscesses are present, dosages as high as 75 mg. per kilogram may be used. This is equivalent to 6 Gm. per day for an adult weighing 75 kg. (165 lb.) and is considered the maximum dosage. For acute or subacute endocarditis due to enterococci, the usual dose is 25 mg. per kilogram of body weight. However, doses as high as 50 mg. per kilogram are occasionally employed, depending on clinical response, tolerance, and severity of the infection.

The foregoing total daily doses are given in two or three divided doses at intervals of 8 or 12 hours. The lower dosages indicated suffice for the majority of infections in which ristocetin may be used. It is emphasized that dosages in excess of 2 to 3 Gm. per day are very rarely required. At this dosage level, side-effects are relatively uncommon. If there is no response within 10 to 12 days, indications for the use of ristocetin should be critically reviewed. Since staphylococcic sepsis tends to recur promptly unless almost all staphylococci are eliminated, treatment should be continued for several days after a definite clinical response has been obtained.

Since ristocetin leaves the body mainly in the urine, a cumulative effect may be produced in the elderly (over age 65) or in younger patients with impaired renal function. In these patients, the recommended dosage should usually be reduced, and approximately half the normal dosage will usually bring about a good clinical response.

Preparations: powder (injection) 500 mg.

Applicable commercial name: Spontin.

Abbott Laboratories cooperated by furnishing scientific data to aid in the evaluation of ristocetin.

CHEMICAL LABORATORY

The Chemical Laboratory has authorized publication of the following statement.

Walter Wolman, Ph.D., *Director.*

Monographs of tests and assays for new and nonofficial drugs adopted by the Chemical Laboratory of the American Medical Association represent an expression of opinion as to what might constitute adequate tests and assays to serve as a reference guide to those interested in the identity and quality of a new and nonofficial drug.

Completed monographs are published in the journal *Drug Standards* for those interested in the details of the procedures. Monographs on the following drugs have appeared in the May-June, 1958, issue of that journal. The cooperation of the listed pharmaceutical firms that furnished samples and data is acknowledged.

Chlorquinaldol	(Geigy Pharmaceuticals)
Hydroxyzine hydrochloride	(J. B. Roerig & Co.)
Tricyclamol chloride	(Burroughs-Wellcome & Co., Inc.) (Eli Lilly & Company)
Zoxazolamine	(McNeil Laboratories, Inc.)

POISON IVY.—A definite but limited reduction in Rhus sensitivity may be attained by oral or intramuscular administration of Rhus allergens. With oleoresin, maximum hyposensitization is obtained with approximately 2000 to 2500 mg. intramuscularly and 2500 to 3000 mg. orally. With the pure, but less potent, pentadecylcatechol, this state is reached with approximately 2500 to 3000 mg. intramuscularly and 3500 to 4000 mg. orally. Hyposensitization occurs in a definite pattern revealed by quantitative patch tests. The reaction to the highest dilution declines first. Only the terminal portion of the dosage-response curve is notably affected. More than a hundredfold decrease in titer is rare. A given fraction of the original sensitivity may be abolished but no more, regardless of how high the total dose or the initial degree of sensitivity. By repeatedly assaulting the skin with dermatitis-producing patch tests over a period of many months, complete clinical desensitization to leaves can be achieved. The actuality of "hardening" has been proved. Complete desensitization of the highly sensitive subject by oral or intramuscular administration is impossible. A variety of systemic and mucocutaneous side-reactions may develop in the course of hyposensitization, accompanied by characteristic changes in the blood. The severity and frequency of these are proportional to the dosage and the sensitivity. The legitimate objectives of hyposensitization are in order of probability briefer duration, less dissemination, and milder attacks. Hyposensitization is temporary. It begins to wane after a few weeks. The original sensitivity is gradually regained within 6 to 10 months, occasionally longer.—A. M. Kligman, M.D., Ph.D., Hyposensitization Against Rhus Dermatitis, *A. M. A. Archives of Dermatology,* July, 1958.

COUNCIL ON MENTAL HEALTH

The following report on medical use of hypnosis was developed by the Council on Mental Health constituting itself as a committee of the whole under the chairmanship of Dr. M. Ralph Kaufman, Council member. The conclusions arrived at herein have come about as a result of a two-year study of medical use of hypnosis. The necessity for this was brought sharply to the attention of the Council by increasing interest in this area; there were frequent inquiries from physicians and dentists throughout the United States as to the effectiveness of hypnosis in the medical and dental fields and numerous requests from physicians for information about where proper and thorough training could be obtained.

Preliminary investigation by the Council revealed that centers for training, under proper auspices, were sharply lacking. It was also noted that many courses in hypnosis were being offered to physicians and dentists by groups who, in the Council's opinion, were not properly accredited by any professional school or university. Likewise, courses were being offered to physicians and dentists on the basis of a 5-lesson or 10-lesson course in hypnosis, offered solely as correspondence courses. During the past two years, the Council has consulted with many physicians and dentists known as expert practitioners of hypnosis and also with many persons of other professions who have had a deep interest in and intimate connection with hypnosis and with research in hypnosis. The Council has also reviewed a report on medical use of hypnosis published in the British Medical Journal, *April 23, 1955. It has reviewed information and opinions as noted in the attached bibliography. The publication of the bibliography indicates only that the material therein has been reviewed; it does not mean that opinions and information are necessarily considered authoritative by the Council.*

In substance, the Council's report indicates that there are definite and proper uses of hypnosis in medical and dental practice in the hands of those who are properly trained. It indicates, also, that there is a severe lack of the necessary training facilities, under proper auspices, in the United States and that such centers should be established. The report thoroughly condemns the use of hypnosis for entertainment purposes, because of the adverse effects it can bring when used by persons not thoroughly medically or psychiatrically oriented. This report was approved by the Board of Trustees and the House of Delegates of the American Medical Association at its June, 1958, meeting in San Francisco.

RICHARD J. PLUNKETT, M.D., *Secretary.*

MEDICAL USE OF HYPNOSIS

The history of hypnosis since the time of Mesmer has been characterized by a series of curious cycles alternating between great interest and almost complete rejection. This phenomenon in itself is an indication of the somewhat mystical aura that has surrounded the subject throughout the years. Recently, owing to a concatenation of circumstances, there has been a reawakened interest in hypnosis. In part, the experiences of World War II contributed to this interest.

The Council on Mental Health of the American Medical Association has for some years received numerous inquiries from physicians throughout the United States relating to the subject of hypnosis, many of them asking for information regarding training programs in this area. A group of serious workers in medicine has been reporting on various aspects of the utilization of hypnosis. In addition, the dental profession has become interested in its use in relation to its own practice. Concurrently, "fringe" groups have been exploiting hypnosis through the press, radio, and television. Overpopularization in this as in other areas of medicine usually leads to oversimplification. Overdramatized events are seized on to the general detriment of sober scientific work.

A subcommittee of the British Medical Association has issued an excellent report, which appeared in the *British Medical Journal,* April 23, 1955, and with which the Council is in essential agreement.

In view of the total situation, the Council on Mental Health constituted itself as a committee of the whole to study the medical use of hypnosis. Some outstanding authorities in this field were invited to participate in several committee meetings, and in addition others were requested to give their opinions through correspondence. The Council expresses its thanks and appreciation to them for their excellent collaboration in this study. It is to be emphasized that the responsibility for this report and the recommendations contained therein are those of the Council.

The work of the Hypnosis Committee was limited to the specific theme of the medical use of hypnosis in its therapeutic aspects, since this seemed to be the most relevant area for the Council's consideration.

There was unanimous agreement that there was no need at this time to question the validity of the various phenomena elicited by hypnotic techniques. Actually, in the literature of hypnosis practically all of these phenomena have been noted in one way or another since the time of Mesmer. In spite of this, however, it is still difficult to arrive at a formulation of hypnosis that is completely satisfactory. The subcommittee of the British Medical Association presented the following definition, with which there was agreement in general:

> [Hypnosis is] a temporary condition of altered attention in the subject which may be induced by another person and in which a variety of phenomena may appear spontaneously or in response to verbal or other stimuli. These phenomena include alterations in consciousness and memory, increased susceptibility to suggestion, and the production in the subject of responses and ideas unfamiliar to him in his usual state of mind. Further, phenomena such as anesthesia, paralysis, and the rigidity of muscles, and vaso-motor changes can be produced and removed in the hypnotic state.

The Committee emphasized certain regressive aspects of hypnosis. It also stressed the fact that hypnotic phenomena were of a wide variety and should not be limited only to the so-called trance state.

In order to begin to understand these phenomena it is necessary to place hypnosis within the general framework of psychodynamic psychology and psychiatry. This has implications not only for the theoretical understanding of hypnosis but also for its therapeutic application and will, therefore, be related in an important way to any teaching and training program. In a sense it is unfortunate that the induction of hypnosis is generally so simple a matter that it requires little or no technical skill or training. This, in itself, represents one of the main hazards in its utilization, since it lends itself to oversimplification and overdramatization with a production of spectacular phenomena that are meat for the charlatan. The use of hypnosis has a recognized place in the medical armamentarium and is a useful technique in the treatment of certain illnesses when employed by qualified medical and dental personnel.

It has already been emphasized in this report that a background of psychodynamic psychology and psychiatry is essential in order to understand the phenomena of hypnosis. It is equally important to insist on the fact that the utilization of hypnotic techniques for therapeutic purposes should be restricted to those individuals who are qualified by background and training to fulfill all the necessary criteria that are required for a complete diagnosis of the illness which is to be treated. Hypnosis should be used on a highly selective basis by such individuals and should never become a single technique used under all circumstances by a therapist. No physician or dentist should utilize hypnosis for purposes that are not related to his particular specialty and that are beyond the range of his ordinary competence. As an example, a trained and qualified dentist might use hypnosis for hypnoanesthesia or hypnoanalgesia or for the allaying of anxiety in relation to specific dental work. Under no circumstances would it be proper for him to use hypnosis for the treatment of neurotic difficulties of his patient. The surgeon, obstetrician, anesthesiologist, gynecologist, internist, and general practitioner may legitimately utilize these techniques within the framework of their own particular field of competence.

A great deal has been said about the hazards of hypnosis, and this is still a controversial matter. One of the members of the conference, who is in a somewhat unique position since he has been consulted professionally by many colleagues who have utilized hypnosis and has also made a survey of results, presented material which indicated that in a number of patients there were harmful results which included the appearance of psychotic conditions and other complications. On the other hand, other consultants either personally or through correspondence indicated that they were not aware of any such harm resulting from the use of hypnosis. This is an area for further research.

Conclusions

General practitioners, medical specialists, and dentists might find hypnosis valuable as a therapeutic adjunct within the specific field of their professional competence. It should be stressed that all those who use hypnosis need to be aware of the complex nature of the phenomena involved.

Teaching related to hypnosis should be under responsible medical or dental direction, and integrated teaching programs should include not only the techniques of induction but also the indications and limitations for its use within the specific area involved. Instruction limited to induction techniques alone should be discouraged.

Certain aspects of hypnosis still remain unknown and controversial, as is true in many other areas of medicine and the psychological sciences. Therefore, active participation in high-level research by members of the medical and dental professions is to be encouraged. The use of hypnosis for entertainment purposes is vigorously condemned.

REFERENCES TO LITERATURE FOR ADDITIONAL READING

Journals

1. Erickson, M. H.: Brief Survey of Hypnotism, M. Rec. **140:**609-613 (Dec. 5) 1934.

2. Erickson, M. H.: Hypnosis: General Review, Dis. Nerv. System **2:**13-18 (Jan.) 1941.

3. Farber, L. H., and Fisher, C.: Experimental Approach to Dream Psychology Through Use of Hypnosis, Psychoanalyt. Quart. **12**:202-215, 1943.

4. Kroger, W. S., and Freed, S. C.: Psychosomatic Treatment of Functional Dysmenorrhea by Hypnosis, Am. J. Obst. & Gynec. **46**:817-822 (Dec.) 1943.

5. Erickson, M. H.: Hypnosis in Medicine, M. Clin. North America **28**:639-652 (May) 1944.

6. Kroger, W. S., and DeLee, S. T.: Psychosomatic Treatment of Hyperemesis Gravidarum by Hypnosis, Am. J. Obst. & Gynec. **51**:544-552 (April) 1946.

7. Kaufman, M. R., and Beaton, L. E.: Psychiatric Treatment Program in Combat, Bull. Menninger Clin. **11**:1-14 (Jan.) 1947.

8. Klemperer, E.: Hypnotherapy, J. Nerv. & Ment. Dis. **106**:176-185 (Aug.) 1947.

9. Wolberg, L. R.: *Hypnotic Experiments in Psychosomatic Medicine*, Psychosom. Med. **9**:337-342 (Sept.-Oct.) 1947.

10. Marcuse, F. L.: *Hynosis in Dentistry*, *Am. J. Orthodontics* (Oral Surg. Sect.) **44**:796-809 (Nov.) 1947.

11. Cooper, L. F.: Time Distortion in Hypnosis, Bull. Georgetown Univ. Center **1**:214-221, 1948.

12. Gidro-Frank, L., and Buch, M. A.: Study of Plantar Response in Hypnotic Age Regression, J. Nerv. & Ment. Dis. **107**:443-448, 1948.

13. Lipton, H. R., and Fancher, J. K.: Narco-hypnosis in Medical Practice, J. M. A. Georgia **37**:6-12 (Jan.) 1948.

14. Schneck, J. M.: Psychogenic Cardio-vascular Reaction Interpreted and Successfully Treated with Hypnosis, Psychoanalyt. Rev. **35**:14-19 (Jan.) 1948.

15. Brenman, M., and Knight, R. P.: Note on Indications for Use of Hypnosis in Psychotherapy, Bull. Menninger Clin. **12**:49-56 (March) 1948.

16. Gill, M. M.: Spontaneous Regression on Induction of Hypnosis, Bull. Menninger Clin. **12**:41-48 (March) 1948.

17. Dorcus, R. M.: Use of Hypnosis in Suppression of Intractable Pain, J. Abnorm. & Social Psychol. **43**:237-239 (April) 1948.

18. Schneck, J. M.: Hypnotic Treatment of Patient with Amnesia, Psychoanalyt. Rev. **35**:171-177 (April) 1948.

19. Erickson, M. H.: Hypnotic Psychotherapy, M. Clin. North America **32**:571-583 (May) 1948.

20. Secunda, L.: Use of Hypnosis in Psychotherapy, Dis. Nerv. System **9**:124-131 (April) 1948.

21. Ford, W. L., and Yeager, C. L.: Changes in Electroencephalogram in Subjects Under Hypnosis, Dis. Nerv. System **9**:190-192 (June) 1948.

22. Bird, H. W.: Varying Hypnotizability in Case of Parkinsonism, Bull. Menninger Clin. **12**:210-217 (Nov.) 1948.

23. Schneck, J. M.: Audiometry Under Hypnosis, Psychosom. Med. **10**:361-365 (Nov.-Dec.) 1948.

24. Brown, W.: Hypnotism and Suggestion: Place in Psychotherapy, Brit. M. Bull. **6**:72-75, 1949.

25. Conn, J. H.: Hypno-synthesis, Hypnosis as Unifying Interpersonal Experience, J. Nerv. & Ment. Dis. **9**:109, 1949.

26. Gorton, B. E.: Physiology of Hypnosis: Review of Literature, Psychiat. Quart. **23**:317-343 (April) 1949; 457-485 (July) 1949.

27. McDowell, M.: Juvenile Warts Removed with Use of Hypnotic Suggestion, Bull. Menninger Clin. **13**:124-126 (July) 1949.

28. Van Pelt, S. J.: Hypnotism and Its Therapeutic Value in Medicine, M. Press **222**:140-146 (Aug. 17) 1949.

29. Strauss, E. B.: Intractable Pain (Including Therapy by Hypnosis), Brit. M. J. **2**:411-413 (Aug. 20) 1949.

30. Watson, C. P., and others: Preliminary Study o Hypnotizability *of Psychotic* Patients, Psychiat. Quart. **23**:657-666 (Oct.) 1949.

31. Buckley, W.: Treatment of Post-traumatic Syndrome by Hypnotic Analysis, J. Nerv. & Ment. Dis. **3**:122 (Jan.-Feb.) 1950.

32. Cooper, L. F., and Erickson, M. H.: Time Distortio in Hypnosis: II, Bull. Georgetown Univ. M. Center **4**:50-68 1950.

33. Ambrose, G.: Technique and Value of Hypnosis i Child Psychotherapy, Brit. J. M. Hypnotism, pp. 1-8, March 1950.

34. Ambramson, M., and Heron, W. T.: Objective Evalua tion of *Hypnosis in Obstetrics*: Preliminary Report, Am. Obst. & Gynec. **59**:1069-1074 (May) 1950.

35. Schneck, J. M.: Spontaneous *Hallucinations* Durin Hypnosis, Psychiat. Quart. **24**:492-494 (July) 1950.

36. Rosen, H.: *Hypnotic* and Hypnotherapeutic Contr of Severe *Pain, Am.* J. *Psychiat.* **107**:*917-925* (*June*) 195

37. Zeckel, A.: Hypnotherapy in Case of *Amnesia* an Suicide Attempt, Psychiat. Quart. **25**:484-499 (July) 195

38. LeCron, L. M., *and others: Postoperative Prolonge* Hiccups Relieved Through *Uncovering by Hypnosis* Psychological Cause, Ann. West. Med. & Surg. **5**:937-9 (Nov.) 1951.

39. Schneck, J. M.: Reading List for Professional Instruc tion (in Hypnosis), Am. J. Psychiat. **108**:381-383 (Nov. 1951.

40. Yellowless, H.: Hypnosis: Its Uses and Limitations i Medicine, J. Roy. Inst. Pub. Health & Hyg. **14**:354-36 (Nov.) 1951.

41. Paley, A.: Hypnotherapy in Treatment of Alcoholism Bull. Menninger Clin. **16**:14-19 (Jan.) 1952.

42. Michael, A. M.: Hypnosis in Childbirth, Brit. M. J **1**:734-737 (April 5) 1952.

43. Schneck, J. M.: Hypnotic Investigation and *Relief o* Recurrent Anxiety Episodes, Dis. Nerv. System **13**:142-14 (May) 1952.

44. Schneck, J. M.: Hypnotherapy of Patient with Anima Phobia, J. Nerv. & Ment. Dis. **116**:48-58 (July) 1952.

45. Klemperer, E.: Therapeutic Hypnosis, J. Nerv. & Ment. Dis. **116**:157-175 (Aug.) 1952.

46. Rosen, H.: Hypnotic and Hypnotherapeutic Unmasking Intensification and Recognition of Emotion, Am. J Psychiat. **109**:120-127 (Aug.) 1952.

47. West, L. J., and others: Effects of Hypnotic Suggestion on *Pain Perception* and Galvanic Skin Response A. M. A. Arch. Neurol. & Psychiat. **68**:549-560 (Oct.) 1952.

48. Schneck, J. M.: Critical Evaluation of Therapeutic Hypnosis, Proc. A. Res. Nerv. & Ment. Dis. (1951) **31**:151-155, 1953.

49. Schneck, J. M.: Hypnotherapeutic First-Aid in Military *Service, Dis. Nerv. System* **14**:47-51 (*Feb.*) *1953.*

50. Schneck, J. M.: Psychogenic Gastrointestinal Disorder and Cephalalgia with Paradoxic *Reactions* to Hypnosis, J. Nerv. & Ment. Dis. **117**:130-134 (Feb.) 1953.

51. Jarabak, J. P.: Practical Aspects of Psychosomatic Dentistry (Hypnosis in Dentistry), Oral Surg. **6**:425-436 (March) 1953.

52. Schneck, J. M.: Medical Hypnotherapeutic Addendum to Case of M. Valdemar, Bull. M. Library A. **41**:144-147 (April) 1953.

53. Schneck, J. M.: Hypnosis for Control of Anxiety, Dis. Nerv. System **14**:274-277 (Sept.) 1953.

54. Seitz, P. F. D.: Experiments in Substitution of Symptoms, Psychosomat. Med. **15**:405-424 (Sept.-Oct.) 1953.

55. Butler, B.: Hypnosis in Care of Cancer Patient, Cancer **7:**1-14 (Jan.) 1954.

56. True, R. M.: Obstetric Hypnoanalgesia, Am. J. Obst. & Gynec. **67:**373-376 (Feb.) 1954.

57. Berman, R., and others: Electrocardiographic Effects Associated with Hypnotic Suggestion in Normal and Coronary Sclerotic Individuals, J. Appl. Physiol. **7:**89-92 (July) 1954.

58. Schneck, J. M.: Ichthyosis (Simplex) Treated with Hypnosis, Dis. Nerv. System **15:**211-214 (July) 1954.

59. Meares, A.: Hypnography—Techniques in Hypnoanalysis, J. Ment. Sc. **100:**965-974 (Oct.) 1954.

60. Busse, E. W.: Application of Hypnosis in Medicine, South. M. J. **48:**310-314 (March) 1955.

61. Heron, W. T.: Principles of Hypnosis, South M. J. **48:**307-310 (March) 1955.

62. Rothman, I.: Psychiatry and Anesthesiology (Including Hypnotism in Anesthesiology), Internat. J. Anesth. **2:**186-190 (March) 1955.

63. Singer, W. B.: Use of Hypnosis to Overcome Inability to Tolerate Retention of Levin Tube, Gastroenterology **28:**669-671 (April) 1955.

64. Meares, A.: Anxiety Reactions in Hypnosis, Brit. M. J. **1:**1454-1455 (June 18) 1955.

65. Mason, A. A.: Surgery Under Hypnosis, Anaesthesia **10:**295-299 (July) 1955.

66. Owen-Flood, A.: Hypnotism and Anaesthetist, Brit. J. Anaesth. **27:**398-404 (Aug.) 1955.

67. Eichorn, R., and Tracktir, J.: Effect of Hypnosis upon Gastric Secretion, Gastroenterology **29:**410-412 (Sept.) 1955.

68. DeLee, S. T.: Hypnotism in Pregnancy and Labor, J. A. M. A. **159:**750-754 (Oct. 22) 1955.

69. Talbert, G. A.; Ready, F. L.; and Kuhlmn, F. W.: Plethysmorgraphic and Pneumographic Observations Made *in Hypnosis, Am. J. Physiol.* **69:**113, 1924.

70. Lundholm, H.: Experimental Study of Functional Anesthesia as Induced by Suggestion in Hypnosis, J. Abnorm. Psychol. **23:**337-355 (Oct.-Dec.) 1928.

71. Klein, D. B.: Experimental Production of Dreams Under Hypnosis, Univ. Texas Bull. **3001:**1-71, 1930.

72. Rosenzweig, S., and Sarason, S.: Experimental Study of Triadic Hypothesis: Reaction to Frustrations, Ego-Defense and Hypnotizability: I. Correlational Approach, Character & Personality **12:**1-19, 1942.

73. Sarason, L., and Rosenzweig, S.: Experimental Study of Triadic Hypothesis: Reaction to Frustrations, Ego-Defense and Hypnotizability: II. Thematic Apperception Approach, Character & Personality **12:**150-165, 1942.

74. Leeds, M.: Hypnotic Regression Series, Persona pp. 1-14, 1949.

75. True, R. M.: Experimental Control in Hypnotic Age Regression States, Science **110:**583-584, 1949.

76. True, R. M., and Stephenson, C. W.: Controlled Experiments Correlating Electroencephalogram, Pulse, and Plantar Reflexes with Hypnotic Age Regression and Induced Emotional States, Personality **1:**252-263, 1951.

Books

1. Binet, A.: La suggestibilité, Paris, Scheicher Frères, 1900.

2. Brenman, M., and Gill, M.: Hypnotherapy, A Survey of the Literature, New York, International Universities Press, Inc., 1947.

3. Cooper, L. F., and Erickson, M. H.: Time Distortion in Hypnosis, Baltimore, Williams & Wilkins Company, 1954.

4. Hypnosis and Its Therapeutic Applications, edited by R. M. Dorcus, New York, McGraw-Hill Book Company, Inc., 1956.

5. Estabrooks, G. H.: Hypnotism, New York, E. D. Dutton & Co., Inc., 1943.

6. Gindes, B. C.: New Concepts of Hypnosis, New York, Julian Press, Inc., 1951.

7. Heron, W. T.: Clinical Applications of Suggestion and Hypnosis, ed. 2, Springfield, Ill., Charles C Thomas, Publisher, 1955.

8. Hollander, B.: Methods and Uses of Hypnosis and Self-Hypnosis, New York, the Macmillan Company, 1928.

9. Hull, C. L.: Hypnosis and Suggestibility, and Experimental Approach, New York, Appleton-Century-Crofts, Inc., 1933.

10. Janet, P. M. F.: Major Symptoms of Hysteria, New York, the Macmillan Company, 1920.

11. Janet, P. M. F.: Principles of Psychotherapy, New York, the Macmillan Company.

12. Janet, P. M. F.: Psychological Healing, New York, the Macmillan Company, 1925, vol. 1 and 2.

13. Journal of Clinical and Experimental Hypnosis, vol. 1, New York, Woodrow Press, 1953.

14. Annual Review of Hypnosis Literature, edited by M. V. Kline, New York, Woodrow Press, Inc., 1953, vol. 1 and 2.

15. Kline, M. V.: Hypnodynamic Psychology, New York, Julian Press, Inc., 1955.

16. Kline, M. V.: Scientific Report on the Search for Bridey Murphy, New York, Julian Press, 1957.

17. Experimental Hypnosis, edited by L. M. LeCron, New York, the Macmillan Company, 1952.

18. Lindner, R. M.: Rebel Without a Cause, New York, Grune & Stratton, Inc., 1944.

19. Magonet, A. P.: Hypnosis in Asthma, London, William Heinemann, Ltd., 1955.

20. Magonet, A. P.: Hypnosis in Medicine, London, William Heinemann, Ltd., 1952.

21. McDonald, A. E.: Psychosomatics and Hypnotism in Dentistry, New Orleans, published by the author, 1949.

22. Moll, A.: Hypnotism, New York, Charles Scribner's Sons, 1890.

23. Moss, A. A.: Hypnodontics, Brooklyn, N. Y., Dental Item of Interest Publication, 1952.

24. Curative Hypnosis, edited by R. H. Rhodes, London, Elek, 1953.

25. Rosen, H.: Hypnotherapy in Clinical Psychiatry, New York, Julian Press, Inc., 1953.

26. Schilder, P.: Nature of Hypnosis, New York, International Universities Press, Inc., 1956.

27. Schilder, P.: Psychotherapy, New York, W. W. Norton & Company, Inc., 1951.

28. Schneck, J. M.: Hypnosis in Modern Medicine, Springfield, Ill., Charles C Thomas, Publisher, 1953.

29. Sidis, B.: Psychology of Suggestion, New York, Appleton-Century-Crofts, Inc., 1910.

30. Steger, M.: Hypnoidal Psychotherapy, New York, Froben, 1951.

31. Stolzenberg, J.: Psychosomatics and Suggestion Therapy in Dentistry, New York, Philosophical Library, Inc., 1950.

32. Van Pelt, S. J.: Hypnotic Suggestion: Its Role in Psychoneurotic and Psychosomatic Disorders, New York, Philosophical Library, Inc., 1956.

33. Van Pelt, S. J., and others: Medical Hypnosis, London, Gallancz, 1953.

34. Watkins, J. G.: Hypnotherapy of War Neuroses, ed. 1, New York, the Ronald Press Company, 1949.

35. Weitzenhoffer, A.: Hypnotism, New York, John Wiley & Sons, Inc., 1955.

36. Wolberg, L. R.: Hypnoanalysis, New York, Grune & Stratton, Inc., 1945.

37. Wolberg, L. R.: Medical Hypnosis, New York, Grune & Stratton, Inc., 1948, vol. 1.

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WORK EFFORT AND THE DISABLED

CUMULATIVE clinical experience over the years has caused a considerable revision of thinking on the ability of the cardiac patient to continue working. In this issue of THE JOURNAL, page 147, Dr. Alvin Slipyan enriches the literature on this important subject with a report on the effect of work effort on the severely disabled cardiac patient in competitive industry. As he points out in the introduction to the article, despite all that has been written recently concerning employment and productivity of the person with cardiac disease, there has as yet been no controlled study to evaluate the effect of competitive industrial activity on the diseased heart.

As his conclusion points out this study of 19 employees, all classified as having severe or advanced heart disease, is unique in that never in the history of private industry has an organization adopted a deliberate policy of employing the "unemployable" person with cardiac disease. Members of the American Medical Association, however, are aware that their employer, Abilities, Inc., is a unique organization. In June, 1957, at its annual meeting in New York, the American Medical Association conferred its Citation for Outstanding Service upon Mr. Henry Viscardi Jr., the founder and president of Abilities, Inc. This was but the third time this high honor of the American Medical Association has been given. Since then many state medical societies have invited Mr. Viscardi to tell them more about Abilities, Inc., at their annual meetings.

Abilities, Inc., was founded in 1952 with four employees. It now employs over 300 persons, 65% of whom work from their wheel chairs. They earn an average hourly rate of $1.65 and the yearly payroll is over a half-million dollars. When compared with the national averages, their attendance and safety record is far superior. With original capital assets of $8,000, it now has assets of well over one million dollars. Dr. Slipyan's report is unique in that the 19 persons with cardiac disease previously considered "unemployable" help make this magnificent record of achievement.

Another interesting factor in this study is that it is part of a long-range research project being conducted by the research-education affiliate of Abilities, Inc., the Human Resources Corporation, with the aid of a grant from the Insurance Company of North America. The objective of this study is (1) to identify the physical, emotional, and social characteristics of severely disabled persons who have been unemployed for long periods of time or who have never had remunerative employment; (2) to evaluate what changes occur in these physical, emotional, and social characteristics when such severely disabled persons are placed in jobs commensurate with their abilities and in which they receive wages commensurate with those paid in regular industry for the same jobs; and (3) to see how these physical, emotional, and social characteristics compare with those of similarly disabled persons receiving public assistance and with those of other physically disabled persons employed in competitive industry and of nondisabled persons in competitive industry.

This is a large-scale, significant undertaking on which the Insurance Company of North America and Abilities, Inc., are to be congratulated, for it may change many of our present concepts on the employability of severely handicapped workers. This current report by Dr. Slipyan, which is but one of several disability categories to be studied, indicates, for example, that employment of persons severely disabled by cardiac disease may actually be beneficial.

It should be pointed out that these persons, as well as all the workers at Abilities, Inc., are not engaged in menial unskilled tasks. Most are highly skilled workers who were trained on the job and are operating extremely modern complex machinery. Parallel with the research being sponsored by the Insurance Company of North America, Abilities, Inc., is conducting another research project, aided by a grant from the Office of Vocational Rehabilitation, Department of Health, Education, and Welfare, on the ability of severely disabled persons to adjust to such complex machinery.

Probably the most unique aspect of the employment policies of Abilities, Inc., is that although it provides all of its disabled employees with complete periodic physical examinations these examinations are given after, not before, employment. This is done purposefully so that some of our present concepts of the physical demands of certain jobs can be tested clinically to prove or disprove their validity. Dr. Slipyan's provocative report raises serious questions concerning the validity of some of our present concepts, practices, and prejudices on employment of the person severely disabled by cardiac disease.

ORGANIZATION SECTION

STATEMENT OF THE A. M. A. BEFORE COMMITTEE ON VETERANS' AFFAIRS OF THE U. S. HOUSE OF REPRESENTATIVES BY RUSSELL B. ROTH, M.D., REGARDING NUMBER OF HOSPITAL BEDS TO BE AUTHORIZED IN VA FACILITIES

Mr. Chairman and Members of the Committee:

My name is Russell B. Roth, M.D., of Erie, Pennsylvania, where I am engaged in the private practice of medicine. I appreciate the opportunity of again appearing before your Committee. My last appearance was on March 5, 1957, when I represented the American Medical Association as a member of the Committee on Federal Medical Services. I appear again today as chairman of that committee.

My testimony today concerns the position of the American Medical Association with respect to the proper number of hospital beds which should be authorized in Veterans' Administration facilities for the care of war veterans—a question which is developed in some detail in House Committee Print No. 222. We have been especially interested in the study made by the Veterans' Administration, the Public Health Service, and the American Hospital Association, which is reported in that document, with its projections, through the year 1986, of the medical facilities required for veterans under various possible plans for future admissions.

Our Association holds one fundamental conviction on this subject. We believe that the Department of Medicine and Surgery of the Veterans' Administration has a single prime purpose—that of providing care for service-incurred or aggravated disease or disability. It was not created by Congress as an instrument of scientific research. It was not designed as a training ground for young doctors. And it was not intended as an agency for providing indigent medical care to the veteran population. It was developed for one purpose only—the provision of unstinting care for the war-injured.

And yet today any analysis of VA figures shows that service-connected medical care is a dwindling phase of VA operations. It is inevitable, as time separates us from the periods of actual combat, that there shall be even fewer cases of acute short-term service-connected illness, and that even these are likely to be acute episodes in the course of chronic disabilities. As the experience of the past is projected into the future it is apparent that service-connected care not only diminishes in volume but becomes overwhelmingly chronic in character. Even now something less than 15% of all new admissions to the VA are for service-connected care, and we suspect that most of these are re-admissions.

No one denies that the VA facilities are already greatly in excess of the requirements for service-connected care. It therefore follows that any further extension of VA medical operations can be justified only as an expansion of non-service-connected care. When Mr. Harvey Higley was VA Administrator he clearly stressed that point during your 1956 hearings. But what is the effect of this emphasis and concentration on non-service-connected care? It can only mean de-emphasis and dilution of service-connected care. There are many factors which must be considered. Who carries out the actual medical care in the Dean's Committee hospitals today—the experienced physician or the trainee? What class of patient commands the major attention of the teachers and the trainees in our VA hospitals today—the chronic, long-term inmates or the more dramatic, challenging, active problems that make up 85% of new admissions? What techniques are being employed in patient care—the conservative and well-tested, or the experimental techniques of research? Is the continuing care of the war-disabled veteran still truly of first magnitude concern to the VA, or has it dropped to a matter of third or fourth magnitude? We would ask your Committee to consider these questions critically.

Closely related to this problem is the whole subject of VA responsibility for care of non-service-connected disability. At the present time approximately 48%, almost half, of all veterans hospitalized for the care of non-service-connected disabilities are under VA auspices, and yet the studies of the Bradley Commission have shown that veterans in general are better off than non-veterans in respect to income, education, and level of employment. You have perhaps seen the lead article in the July issue of *Harper's* magazine by Mr. John E. Booth, himself a veteran, who comments "Veterans, who are now better off as a group than the rest of the population, will also be better off in their old age; they'll acquire more savings, private pension-plan payments, and other benefits than non-veterans." If this be true, and it seems reasonable in view of the all-out effort made by Congress and this Committee to aid the serviceman in his return to civilian life, how can it follow that nearly half of all veterans with non-service-connected conditions are in an "inability-to-pay" category entitling them to VA hospitalization? And let us note that this is not a figure distorted by a preponderance of chronic tuberculous and neuro-psychiatric cases. The figure is 45% of the cases in the general medical and surgical classification. Mr. Booth, in the previously mentioned article, has as his thesis the view that such an unrealistic program subsidizes veterans who do not need it—"while the seriously disabled who do need it get short-changed."

In any event, Congress should surely determine its policy. Is it intended to furnish tax-paid federal medical care for all veterans who request it, and who are willing to indicate "inability to pay"? There are sizable waiting lists in this category, as you know. Future projections guarantee that as our wartime veteran population ages these lists will grow. If there should be an insistence on the part of Congress that the taxpayer actually is responsible for the care of disability unrelated to service, then there most assuredly is an obligation upon that Congress to define what constitutes "inability to pay." Today this is a matter of individual conscience. Mr. Booth refers to the affidavit on the 10-P-10 form as "something of a joke" because the law forbids the VA even to check up on it. Why should this be so? We would ask a sincere question: "Would this Committee permit the VA to grant a pension to a veteran without ascertaining his income level and his circumstances of need?"

What does the non-veteran do about the costs of illness? He buys insurance, or he pays in installments, or he meets the cost in other ways. If he really cannot afford hospitalization, the community pays for it. The A. M. A.'s Committee on Indigent Care has made a number of field studies on local and state medical care plans—a report of that Committee's studies occupies 90 pages of the record of your July 1953 hearings. This report does not disclose that there is even one welfare department in the country which will pay for a man's medical care purely on his unsupported statement that he cannot afford it.

We would respectfully suggest that this Committee authorize a serious study by the Government Accounting Office and the Veterans' Administration on the subject of income levels in NSC cases—primarily in the GM and S hospitals. We would further suggest strengthening of the law to permit examination of the admission affidavit which is so lightly considered in these times.

Now may we examine further the implications of this recent projection of future needs for VA hospital beds. The inexorable processes of nature furnish the patients. Medicine and its allied professions must provide the personnel. Congress must appropriate the funds for the mountains of brick and mortar which will be required to expand the facilities. And the taxpayer must produce the cash. It is certainly to the taxpayer's interest to know that his money is wisely spent. What will a million dollars of tax money do today in providing medical care? Our studies indicate that one million dollars in a Veterans' Administration GM and S hospital will care for 1,696 veterans. In a private GM and S hospital it would care for 5,389 patients—not veterans alone. It would include veterans wives, children, parents, friends and neighbors. Look at the same arithmetical problem in reverse. One-hundred n-s-c veterans receiving GM and S care in a VA hospital cost the taxpayer $58,953.00 while in a private non-federal general hospital the cost would be $18,572.00. We do not believe that throwing away nearly 70 cents out of every dollar spent on this medical care is a reasonable financial course for this nation.

We have dwelt largely on the problems of GM and S hospitals for a very real reason. It is our contention that the responsibility of government in various categories of illness must be defined. We submit that all non-service-connected illness in those unable to pay is the responsibility of government at the local community level. Chronic care for tuberculosis has traditionally been provided by the state government, acting for the communities, and this is probably true also in most neuropsychiatric disabilities. What then is the responsibility of the federal government to its disabled citizens be they veterans or non-veterans? This, we believe—needs definition. States for the most part can already meet the n-s-c needs in tuberculosis. As yet they cannot meet the neuropsychiatric needs and we will concede an interim period during which VA facilities which already exist may very appropriately be used. It is not, however, the responsibility of the federal government to operate a system of medical care for illness unrelated to military service in vicious competition with the private free-enterprise medical care system and the now well established insurance principles.

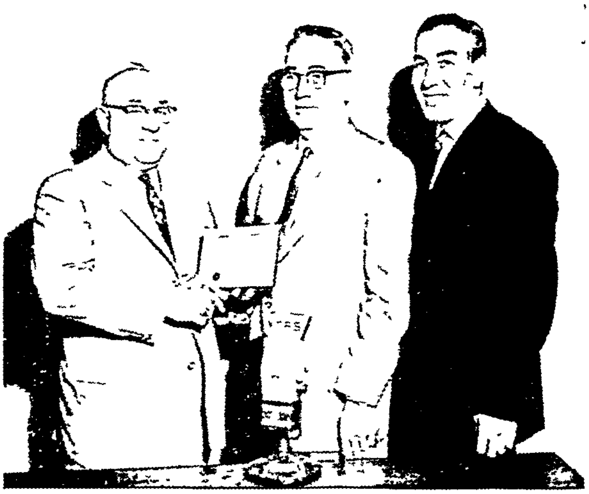
It has been alleged in correspondence between your Committee, the President, and the Administrator of the Veterans' Administration that there has been a reduction in VA hospital beds. This, we are convinced, is a bit of statistical sleight of hand. The accomplished daily patient load has increased annually to a present high of 111,740, and the average number of VA operating beds has similarly increased to a current peak of 121,257. By no criterion do these figures reflect any contraction in operation nor do they substantiate the statement which has been made that current policies being followed by the Veterans' Administration at the direction of the Bureau of the Budget are circumventing the policy for hospitalization of war veterans as established by Congress. The alarming thing is that no contraction of operations seems to be anticipated. The Administrator of the VA reports an increase in operating beds in the next 18 months and an increased rate of construction of new facilities in the next fiscal year. Today, according to Mr. Whittier's figures, we have three times as many operating beds as service-connected patients. By 1986, according to the projections of the House Committee Print No. 222, we will have five times as many operating beds as service-connected patients—without building a single new bed. Already 75% of the tuberculous patients and 90% of the GM and S and neurological patients are being treated for non-service-connected conditions. The main function of the VA hospital system has become, in fact, if not in law or theory, the provision of non-service-connected care. The American Medical Association is not alone in deploring such an evolution. Two comprehensive studies of the Veterans' Administration have been made during recent years, both under chairmanship of persons of illustrious background and unassailable ideals of loyalty—General Omar Bradley and Mr. Herbert Hoover. Both studies have reached conclusions closely akin to our own. There is a grave responsibility in plotting a course which runs counter to the sound advice from these sources.

Finally, let us comment on the worth of our testimony. We are not asking for more jobs for physicians. We do not ask for more or larger fees. True—we have been accused by veterans organizations, and by the VA itself in times past, of a selfish interest in this subject. But let me assure you that if this were a conflict between the best interests of the patient-public and the vested interests of the medical profession the profession would inevitably yield to the public as it has on every occasion in the past. We ask not for an increase in VA medical jobs but for a decrease. We ask the federal government not to pay us for medical services to multitudes of patients whom we are prepared to serve without charge in our community hospitals. We do not think you can honestly find us insincere. We ask if you feel that the wartime wounded of our Armed Services—in the far-flung combat areas of Europe, the Pacific, and Korea received devoted and competent medical care at the time of their greatest need. If the answer is "yes," we would only point out that the physicians who provided these services, having passed in large numbers from service into civilian practice, are the ones who bring this testimony today. We who practice medicine are predominantly veterans, and we are also taxpayers, 100% of us.

In American medicine we may give our professional advice, but it is still up to the patient to decide whether this advice shall be followed or ignored. So it is here. We can only tell you, earnestly and sincerely, that in our considered judgment the veterans of this nation will be best served by a non-federal medical care system. We will pledge our assistance to you in every possible way in maintaining care for service-connected disability at the highest possible level. We will cooperate with you to the utmost in planning the complicated matter of returning non-service-connected care to the communities, where it properly belongs.

A. M. A. AWARD TO CBS

Arthur Hull Hayes, President of CBS Radio (center in photo), holds a plaque awarded to the CBS Radio Network by the American Medical Association for a special series of programs broadcast by *CBS-owned Radio Station KCBS, San Francisco,* to its 38 stations in the western network during the A. M. A.'s 107th Annual Meeting last June. Presenting the award is Dr. W. W. Bauer, Director of Health Education for the A. M. A. (left), as Jules Dundes, Vice-president in charge of station administration for CBS Radio (right), looks on. The series, titled "Pulse of Medicine," featured a panel of doctors discussing various aspects of medicine and surgery.



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BUREAU OF MEDICAL ECONOMIC RESEARCH

NEW EXPERIMENTS TO PROVIDE VOLUNTARY HEALTH INSURANCE FOR RETIRED PERSONS

Walter Polner, Ph.D.

By the summer of 1957 it was estimated that 6 million persons aged 65 years and over had voluntary health insurance to pay for all or part of their hospital, surgical, and medical bills.[1] It is expected that this total coverage will rise, due to new experiments now being carried on by the Blue Cross and Blue Shield plans, as well as by the private insurance industry.

A large percentage of this coverage accrued from group enrollment. A recent (February, 1958) survey conducted by the Blue Cross Commission and the Blue Shield Medical Care Plans showed that over 3,500,000 persons are covered by these plans alone. Simultaneously, a series of additional experiments have been started by firms, associations, and welfare funds to provide such benefits to their ex-employees and members. It is this area of extension of benefits from group programs that may hold a major hope for additional coverage for the growing aged population in the near future.

The present situation is one of experimentation with the large majority of the new plans less than four years old. Pioneer plans such as the General Electric or Sears Roebuck experiments (10 and 8 years old, respectively) are considered old. However, the provision for conversion to individual policies has been a part of the basic Blue Cross and Blue Shield philosophy almost from their beginning; hence, the present large proportion of enrollment of the aged under these plans.

The new plans, both under Blue Cross–Blue Shield and commercial insurance auspices, have burgeoned in the last few years. Variations of Blue Cross and Blue Shield plans have been created; but, if any new significant trend has been created, it has been in the sharing of the cost of these plans by the employer for the employee after retirement and/or the adoption of extended benefit plans. Since March, 1957, the Schlitz, Miller, and Pabst brewing companies in Milwaukee have been paying 50% of the charges of Blue Cross and Blue Shield for their retired employees.

Along with these trends under Blue Cross and Blue Shield plans, additional experiments have been undertaken by a variety of firms. While most of these plans are still new, some common characteristics are quickly perceived. These are as follows:

All are very young. Except for the Blue Cross plans, the majority have been implemented since the Korean war, such as the plans of the International Harvester Company, the Thompson Products Company of Cleveland, and the Argonne National Laboratory in Illinois.

They are primarily geared to treatment of the acute illness. Such plans as that of the Seiberling Rubber Company, providing 120 days per one continuous period of disability, are basically meeting the problems of the individual with an acute condition.

Not many persons have actually retired under these plans. It is the estimate of the United Rubber Workers that for all the large units in the rubber industry under their contracts only 7,500 employees have retired since the installation of the program.

Costs are still within the reasonable range contemplated at the origin of the plan. More than one administrator has commented that the plans have resulted in a performance much better than the companies had expected. This may be due to the fact that the persons retiring now under the plans have had a continuum of care under the plans while in employment and many diseases had been cared for earlier in life, or to the fact that in a period of high employment many persons have not retired and taken advantage of these plans.

The retired group under these plans are primarily in the age group 65 to 69, or still "young." This young part of the aged does not have an unreasonable utilization of such plans.

Many of these plans are tied into an automatic mechanism for payment. In some cases, in order for the individual to continue such hospital and medical coverage it is necessary to sign a prior authorization for deductions from the company pension payment, such as many plans now operating under Michigan Blue Cross.

Benefits are limited in one form or another. Although benefits for the active employees are limited normally by illness or annual limitations, most of

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Research Associate, Bureau of Medical Economic Research, American Medical Association.

the new group plans limit the benefit to some maximum annual or lifetime amounts. Some plans eliminate maternity benefits or other extras.

Selected Experiments Among New Group Plans

Name and Carrier	Benefits: Hospital	Benefits: Surgical	Benefits: Miscellaneous
Philadelphia Plant, American Viscose Corporation with Associated Hospital Service of Philadelphia and Travelers Insurance Company	120-Day comprehensive plan covers bed and board, including special diets; general nursing service; use of operating and treatment rooms and equipment; drugs and dressings; 30 days of hospital care during each contract year for mental and nervous conditions	$300 Standard Surgical Plan of Travelers Insurance Company	Unlimited laboratory tests; EKG; BMR tests; physical therapy; oxygen and oxygen therapy; x-ray examinations; administration of blood and blood plasma; intravenous injections and solutions
Harvard University Employees, Cambridge, Mass., with Blue Cross-Blue Shield	Covers hospital care in ward or semiprivate room; complete cost of first 15 days (on 16th day patient pays $6 per day toward cost of bill); use of operating room; laboratory tests; oxygen tents; x-ray services with necessary supplies and equipment; drugs and medications; appliances; blood and cost of administering transfusions	Covers all generally accepted operations and assisting and after-care for major operations; oral surgery, including regular extraction of 7 or more teeth	80% of charges for private duty nurse; 80% of charges for following services after $25 deductible during each calendar quarter: physician services for home and office visits, services of Visiting Nurses Association, prescription drugs, physical therapy by registered therapist, room and board up to $8 in nursing home or convalescent home, laboratory and pathology services, diagnostic x-ray serirces, blood or plasma; 60 days of hospitalization for mental illnesses or pulmonary tuberculosis; those with family income of $5,000 a year or less receive full coverage for medical, surgical, and anesthesia service by participating physician in Massachusetts; lifetime limits of $5,000 per person and maximum benefit per calendar year limited to $1,000 per person; on death of retired person, spouse may continue protection for period not to exceed 6 mo., after which spouse may apply for direct payment coverage with Massachusetts Blue Cross and Blue Shield.
Bird and Son, Inc., East Walpole, Mass., with Aetna Life Insurance Company	Up to $10 a day for first 60 days of hospitalization for retired employee and his dependent wife; all necessary hospital charges, other than charges for room and board, for first 60 days of confinement	$200	No benefits if confinement is due to pregnancy or resulting childbirth or miscarriage
Walker Manufacturing Company, Racine, Wis., with Blue Cross-Blue Shield plans	120 days for each hospitalization, including care for nervous and mental conditions in general hospitals (for latter conditions in nervous or mental institutions, up to $10 for 120 days of care for any one period of disability; such period shall be total duration of all sanatorium confinements separated by less than 180 days); benefits include semiprivate bed and board; general nursing care; use of operating room and delivery room; dressings; plaster casts and splints as provided by hospital; laboratory and BMR tests; x-ray examinations; EKG; physiotherapy; administration of blood and blood plasma; drugs; x-ray and radium therapy for proved malignancies, except those of skin	"Reasonable" charges made by attending physician	Outpatient benefits for administration of x-ray or radium therapy for proved malignancies except those of skin; "reasonable" charges for diagnostic x-ray and laboratory services; "reasonable" charges for attending physician during first 120 days of hospitalization per illness; home and office medical services; cost deducted from pension check of company; dependents can continue coverage under direct payment to Blue Cross and Blue Shield plans
Electrical Welfare Trust Fund, Washington, D. C., with Continental Casualty and Continental Assurance Companies	$15 a day for 31 days for retired employee or spouse; hospital extras, $300	$300	Physician services in hospital, home, or office; covers blood bank, x-ray procedures in and out of hospital; laboratory procedures; drugs; maternity benefits eliminated
General Tire and Rubber Company, Akron, Ohio, and Waco, Texas, divisions (hourly employees), with Equitable Life Assurance Society	120 days; covers semiprivate room for any one confinement	$250 surgical schedule	Special charges covered for miscellaneous hospital services; physician services in hospital up to 120 days
Central Hudson Gas and Electric Co., Poughkeepsie, N. Y., with Equitable Life Assurance Society	Major medical type; charges for hospital room and board up to $25 a day	Charges for diagnosis, treatment, and surgery	Private duty nursing by registered nurse; charges for local ambulance service, equipment, medication, appliances, x-ray service, laboratory tests, use of radium and radioactive isotopes, oxygen, blood and blood plasma, iron lung, physiotherapy and similar services, supplies, and treatment; must continue Blue Cross and Blue Shield at own expense in order to receive major medical benefits, consisting of payments of 75% of "covered charges" relating to each different accident or illness for employee or dependent up to $5,000 after payment of deductible; separate $5,000 maximum and separate deductible for each unrelated cause for each individual

There are subsidies of some sort. The employer may pay part of the cost. If the retired individual pays a group rate, part of his cost is borne through a higher group rate for active employees than that which they would otherwise pay. Of course, the exact extent and nature of this subsidy for most firms is unknown. However, a recent survey of such provisions of firms with Blue Cross coverage in Michigan shows that the subsidy was 3½% of the total premium which the active employees were charged in order to sustain the retired persons in their plan.[2]

The plans are subject to change. Many plans provide the same daily benefits for retired employees as for regular employees. As these plans for active employees are changed, it is expected that the benefits for the retired workers will be changed. However, many companies are still experimenting with the type of plan they will use. As they obtain more experience they will modify their plans accordingly.

Many plans cover only retirements effective after the plan has been instituted. In addition, only those with some length of seniority have all the benefits, as under the plan of the Carrier Corporation.

There are limited statistical data. In many cases, companies have not established special statistical tabulations due to the smallness of the samples involved.

Comment

While these patterns are easily seen in the study of plans now available, they have not answered the fears of many employers on the cost problems raised by such coverage. In a survey made by Michigan Blue Cross, the range of guesses as to future costs runs from 2 to 10 times[3] as much for utilization of hospitals by the aged.

There is no doubt that if persons now in the aged group have voluntary health insurance they will use hospital and medical care more than those below 65 years of age.[4] The recent study published by the New York State Insurance Department showed that the average days of confinement for males per person per year under a 120-day benefit insurance contract at 25 years of age is 0.53 days; at 55 it is 1.5 days; at 65 it is 2.43 days; at 75 it is 3.66 days; and at 85 it is 6.27 days.

Older persons utilize the plans to a greater extent. The fact is that all persons have become more accustomed to using the hospitals. General hospitals have changed their role. They no longer care for only the critically ill but now also provide an elaborate diagnostic facility as well as care for the mentally ill and others with illnesses previously handled in the home or the doctor's office.

The very nature of the insurance policy will encourage additional use of hospitals. In the recent survey of the New York State Insurance Department it was shown that there was more utilization under a 120-day hospital policy than under a 31-day policy.[4]

Advances have been made in medical science which make it possible to treat successfully many conditions formerly regarded as hopeless. However, these medical advances also serve to cut the length of stay in the hospital or in bed at home.

There has been inflation of the cost of health care over the past decade. Hospital costs seem to be rising at the rate of 5% per annum.[5] Planning for a lifetime protection must consider costs in the future.

There is greater availability and excellence of hospital facilities to be used. Under the Hill-Burton Act alone over 115,000 additional hospital beds have been built since 1948. Substantial facilities also have been built during these years outside the Hill-Burton program.

For companies planning a program of benefits tailor-made to the needs of their employees, the answers to many questions are unknown quantities. Since they do not have enough information to make a reasonable guess, they will make no guess. They fear the future. Unfortunately, fear is one of the most difficult human emotions to deal with.

In spite of all of these questions, more and more companies, either because of their belief in the need for such programs or due to collective bargaining pressure, have experimented with bold new programs. In this fast-changing situation plans have evolved in an attempt to answer the needs of retired employees. Certainly, not all necessary information has been obtained, but if all companies were to wait for all necessary information, action would never be forthcoming. These experiments may give the elements of basic information needed to formulate patterns for the more timid firms.

Some selected experiments are listed in the table. In every case these experiments have been created in spite of lack of absolute knowledge as to future costs. More experiments are being undertaken every day by companies or fund administrators or trustees. There has been no one single answer produced for the many aspects of financing medical, hospital, and surgical care for the aged. These answers have been provided by those firms who are willing to take a calculated risk. Perhaps the best philosophy for other firms is that of Mr. Justice Brandeis, who stated, "If we would guide by the light of reason, we must let our minds be bold." It is reasonable and proper for the aged to have voluntary health insurance. All that is needed is a bit more acceleration of boldness.

References

1. National Opinion Research Center: Unpublished data.

2. McNary, W. S.: Continuing Benefits for Retired Employees, read before the American Management Association, Chicago, March 6, 1958.

3. Reference 2, p. 2.

4. Voluntary Health Insurance and the Senior Citizen: Report on Problem of Continuation of Medical Care Benefits for the Aged in New York State, report of the State of New York Insurance Department, Feb. 26, 1958, p. 60.

5. Reference 2, pp. 2 and 3. Dickinson, F. G.: Medical Care Expenditures and Prices, Miscellaneous Publication M-106B, Bureau of Medical Economic Research, Chicago, American Medical Association, 1955. Statement by E. A. Van Steenwyk, Executive Vice-President, Associated Hospital Service of Philadelphia, before Honorable Francis R. Smith, Insurance Commissioner of the Commonwealth of Pennsylvania, Philadelphia, January, 1958.

MEDICAL NEWS

CALIFORNIA

Annual Postgraduate Assembly in Santa Monica.—The 10th annual Postgraduate Assembly sponsored by Saint John's Hospital will be held Sept. 11-13, 1958. Guest speakers will be Drs. Brian D. Best, obstetrician, Winnipeg, Canada; Dr. John D. Camp, radiologist, Los Angeles; Dr. Lester R. Dragstedt, surgeon, Chicago; Dr. John W. Pender, anesthesiologist, Palo Alto; Dr. Albert M. Snell, internist, Palo Alto; and Dr. Sheldon C. Sommers, pathologist, Boston. Dr. John C. Eagan, Los Angeles, is founder and director of the Postgraduate Assembly. All sessions will be held at Saint John's Hospital, Santa Monica.

Personal.—The University of California at its 95th commencement at Berkeley, conferred an honorary degree of doctor of laws upon Dr. Robert T. Legge, professor of hygiene emeritus. Dr. Legge, who served two terms on the Council of Industrial Health, American Medical Association, was the recipient of the W. S. Knudsen award for the "most outstanding" contributions to industrial medicine (1951).——Dr. Joseph J. Downing, formerly acting director of the New York State Mental Health Research Unit in Syracuse, has been appointed program chief of the Mental Health Section of the San Mateo, California, County Department of Health and Welfare.

New Genetics Department at Stanford.—Joshua Lederberg, Ph.D., chairman, department of medical genetics, University of Wisconsin School of Medicine, Madison, has been named to head a new department of genetics at Stanford University School of Medicine, effective in April, 1959. Dr. Lederberg, who has also served as a visiting professor at the universities of California and Melbourne, Australia, is a member of the National Academy of Sciences and a consultant to the National Institutes of Health. Establishment of the new department of genetics, as well as of a new department of biochemistry, is a move toward integration of the medical school with the university. Stanford Medical School is now located in San Francisco. By the fall of 1959 it will occupy a new 22-million-dollar medical center on the campus near Palo Alto.

FLORIDA

University Grants.—The University of Miami School of Medicine, Coral Gables, has received a grant of $129,000 from the U. S. Public Health Service for scientific equipment for its new research building, to be completed in late 1959. The new eight-story structure will cost over 2 million dollars.——Two grants totaling $107,000 have been received by the University of Florida College of Medicine, Gainesville, both made by the National Institutes of Health. Dr. Samuel P. Martin, head, department of medicine, received a grant of $82,000 for a five-year study of human leukocytes. An additional grant of $25,000 was made by the NIH to support undergraduate cardiac training of medical students, the third year this grant has been renewed. It will be administered by Dr. William J. Taylor, assistant professor of medicine.

ILLINOIS

Ophthalmology and Otolaryngology Meeting in Springfield.—The 31st annual meeting of the Central Illinois Society of Ophthalmology and Otolaryngology will be held in Springfield Sept. 19-21. Guest speakers will include Drs. Louis J. Feit, New York City (otolaryngology), and Ichiro D. Okamura, Boston (ophthalmology). The society speakers will be Drs. Louis R. Kent, Champaign, in ophthalmology, and Grover C. Otrich, Belleville, in otolaryngology. The night of Sept. 19 Dr. S. Glidden Baldwin, of Danville, will be the speaker. For information write Dr. Clarence A. Fleischli, Secretary-Treasurer, Central Illinois Society of Ophthalmology and Otolaryngology, 520 E. Allen St., Springfield, Ill.

Chicago

Home for Incurables Affiliates with University of Chicago.—The Chicago Home for Incurables and the University of Chicago have entered into an affiliation by which the home is to construct a new hospital adjacent to the University Clinics and become a model center for study and treatment of chronic illness, with special emphasis on older age groups. The home will use 1.5 million dollars of its funds to build the new hospital, which will be three stories and [illegible] ent, [illegible]e university will
p [illegible] sp [illegible] ed services which
[illegible] an active program
[illegible] The Chicago Home
[illegible] by the will of Cla-
[illegible] in 1885. The home

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

was incorporated on Dec. 20, 1886, and opened its main building in 1890. A majority of the patients pay partial costs of their maintenance.

Prize for Investigation in Medicine.—The Institute of Medicine of Chicago is offering an annual prize of $300 for the most meritorious investigation in medicine or in the specialties of medicine. The investigation may be in the fundamental sciences, provided the work has a definite bearing on some medical problem. Competition for 1958 is open to graduates of Chicago medical schools who completed their internship or one year of laboratory work within a period of five years prior to Jan. 1, 1958, excluding their terms of service in the Armed Forces. Manuscripts must be submitted to the Secretary of the Institute of Medicine of Chicago, 86 E. Randolph St., Chicago 1, not later than Dec. 31. The prize paper will become the property of the institute. If no paper submitted is deemed worthy of the prize, the award may be withheld at the discretion of the board of governors.

Program for University of Illinois Expansion.—A $32,500,000 program for the construction of eight new buildings and rehabilitation of older ones was presented July 29 to the board of trustees for the University of Illinois Professional Colleges in the Medical Center District on Chicago's west side. An appropriation of $6,724,000 will be sought in the next General Assembly to initiate the program during 1959-61. It is part of a 10-year building plan for the entire university. The colleges of dentistry, medicine, pharmacy, a school of nursing, a 620-bed general hospital and a division of the graduate college form the nucleus of the university's professional colleges. Major elements of the building program are as follows:

Medical Research Laboratory; Medical Sciences Building; Enlargement of the University of Illinois Hospitals; Library—Basic Science Building: A new building is planned to house the university's Library of Medical Sciences; Auditorium—Gymnasium; Physical Plant Service Building; Drug and Horticultural Experiment Station; Classroom—Office Building.

Personal.—Dr. Heinz Grunze, co-chairman of the department of medicine at the Free University of West Berlin, will begin a one-year fellowship at the University of Chicago medical and biological research center on Sept. 1, under a $3,600 grant from the American Cancer Society. He also will lecture in the university's School of Medicine on thoracic cytology.——Dr. Murray Rabinowitz of the Rockefeller Institute for Medical Research has been appointed director of the new cardiopulmonary laboratory of the University of Chicago Clinics.——Dr. Heinz Kohut, secretary, Chicago Psychoanalytic Society, was appointed professorial lecturer in the department of psychiatry at the University of Chicago, effective July 1. Dr. Kohut, who received his doctor of medicine degree from the Medical School of the University of Vienna, Austria, has been on the teaching faculty of the Chicago Institute for Psychoanalysis since 1953.——Dr. Bernard J. Michela has been appointed director of the Rehabilitation Institute of Chicago, succeeding Dr. Joseph H. Chivers, who was elected to the board of directors following his resignation from the post he had held since 1955.

KENTUCKY

Annual State Meeting in Louisville.—The Kentucky State Medical Association's annual meeting will be held Sept. 23-25 at the Columbia Auditorium, Louisville. Two panel discussions are planned, "The Pregnant Patient" and "Geriatrics and Surgery," moderated by Drs. Frank R. Lock, Winston-Salem, N. C., and Rattig A. Griswold, Louisville, respectively. Dr. Edward B. Mersch, of Covington, president of the association, will present an address the morning of Sept. 23. Thirteen specialty groups will meet simultaneously the afternoon of Sept. 24. At the presidents luncheon (11:50 a. m., Sept. 24) Clarence Manion, J.D., South Bend, Ind., will present "The Disease Called Despotism." Scientific exhibits are planned. For information write Mr. J. P. Sanford, Executive Director, Kentucky State Medical Association, 1169 Eastern Parkway, Louisville 17, Ky.

MICHIGAN

Building for Industrial Medicine.—Construction of an $800,000 Industrial Medicine and Hygiene Building began Aug. 18 at Wayne State University College of Medicine, Detroit. Radiation studies will be conducted on two specially designed and equipped floors of the four-story building. According to Dr. Gordon H. Scott, dean of the college, research to be conducted in the building will include study of atmospheric pollutants, including radioactive substances, and vehicular health hazards as they may attend certain occupations. A special area for electronic instrumentation will be installed, and a laboratory for study of exhaust fumes will be on the first floor.

MISSOURI

Dr. Gelperin Appointed Health Director.—In a reorganization of the city health division of Kansas City, Dr. Abraham L. Gelperin, of Chicago, was named director of health and hospitals, effective August 1 to succeed Dr. Hugh L. Dwyer, who became director of public health services.

NEVADA

Annual State Meeting in Elko.—The 55th annual meeting of the Nevada State Medical Association will be held Sept. 17-20 in Elko. A panel discussion on anesthesiology will be moderated by Dr. Charles

F. McCuskey, head, department of anesthesiology, University of Southern California School of Medicine, Los Angeles. The program includes the following out-of-state speakers: Drs. Wallace S. Brooke, Paul D. Hoeprich, and Scott M. Smith, Salt Lake City, Utah; John B. Dillon, Los Angeles; Lowell A. Rantz and Victor Richards, San Francisco; and Abe Ravin, Denver. Mr. Roland F. Logan, Los Angeles, will be the guest speaker at the annual banquet Sept. 18. A golf tournament and ladies' program are arranged. For information write the Nevada State Medical Association, P. O. Box 118, Reno, Nevada.

PENNSYLVANIA

Address on Conquest of Space.—Temple University School of Medicine, Philadelphia, will hold a special convocation, Oct. 23, at which Wernher von Braun, Ph.D., will present an address at 10:30 a. m. at the Dental-Pharmacy Auditorium, 3223 N. Broad St., on "The Conquest of Space." Dr. von Braun, who is director of the Development Operations Division of the Army Ballistics Missile Agency at Huntsville, Ala., will be awarded an honorary degree of doctor of science at this time. On the same day, at 2:45 p. m., at the ninth annual Military Medico-Dental Symposium on Space Medicine at the U. S. Naval Hospital in Philadelphia, Dr. von Braun will again speak on the same subject.

Philadelphia

University Grant.—A health research facilities grant of $46,038 to The Woman's Medical College of Pennsylvania has been approved by the U. S. Public Health Service, and will be used toward the purchase of the scientific equipment for the college's 2-million-dollar Research Wing, to be constructed this fall. The college's development program, under the chairmanship of Mrs. John B. Kelly, vice-president of the board of corporators, has a goal of 4 million dollars.

SOUTH DAKOTA

General Practice Meeting in Huron.—The annual meeting of the South Dakota Chapter of the American Academy of General Practice will be held Sept. 19-20 at the Marvin Hughitt Hotel, Huron. A total of 24 papers are scheduled for presentation, including anatomy of the hand and forearm, by Walter L. Hard, Ph.D., dean, University of South Dakota School of Medical Sciences, Vermillion. Dr. Arthur A. Lampert, of Rapid City, president of the association, will discuss clinical fluid balance problems the morning of Sept. 20. Round-table discussions will conclude each day's program.

WISCONSIN

Dr. Kersting Succeeds Dr. Foerster.—Dr. David W. Kersting has been appointed professor and chairman of the department of dermatology at Marquette University School of Medicine, Milwaukee, succeeding Dr. Harry R. Foerster, who becomes clinical professor emeritus Aug. 15. Dr. Kersting is the director of graduate training in dermatology at the Veterans Administration Hospital at Wood and at Marquette, and chief of the dermatology and syphilology sections at Wood. He will direct undergraduate teaching and research at the medical school.

GENERAL

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

	Aug. 16, 1958		Aug. 17, 1957
Area	Paralytic Type	Total Cases	Total
New England States			
Maine	..	..	..
New Hampshire	..	1	..
Vermont	..	..	..
Massachusetts	..	1	..
Rhode Island	1	1	..
Connecticut	..	2	1
Middle Atlantic States			
New York	12	19	5
New Jersey	5	17	5
Pennsylvania	5	6	3
East North Central States			
Ohio	3	14	17
Indiana	1	3	19
Illinois	4	7	20
Michigan	20	42	47
Wisconsin	1	3	32
West North Central States			
Minnesota	1	1	2
Iowa	..	4	8
Missouri	4	5	10
North Dakota	2	2	..
South Dakota	..	..	4
Nebraska	..	..	3
Kansas	1	1	5
South Atlantic States			
Delaware	..	4	..
Maryland	1	1	..
District of Columbia	..	..	7
Virginia	6	7	2
West Virginia	3	5	2
North Carolina	3	12	19
South Carolina	..	..	4
Georgia	1	3	6
Florida	1	1	..
East South Central States			
Kentucky	1	1	7
Tennessee	1	7	7
Alabama	6	6	2
Mississippi	2	10	5
West South Central States			
Arkansas	..	3	1
Louisiana	2	3	6
Oklahoma	..	1	5
Texas	16	22	21
Mountain States			
Montana	5	5	..
Idaho	..	1	1
Wyoming	..	..	1
Colorado	1	1	..
New Mexico	..	..	6
Arizona	..	1	2
Utah	..	1	..
Nevada	..	..	..
Pacific States			
Washington	..	1	1
Oregon	..	1	..
California	5	7	28
Territories and Possessions			
Alaska	..	..	..
Hawaii	5	5	..
Puerto Rico	..	..	4
Total	119	238	318

Annual Meeting of Vermont and New Hampshire Societies.—The ninth annual combined meeting of the Vermont State Medical Society and the New Hampshire Medical Society will be held Sept. 19-22 at the Mount Washington Hotel, Bretton Woods,

N. H. The general sessions will have the following themes: communications, rehabilitation (two), and trauma, with Drs. Arthur W. Burnham, president, New Hampshire Medical Society, James P. Hammond, president, Vermont State Medical Society, Clinton R. Mullins, president-elect, New Hampshire Medical Society, and Wayne Griffith, president-elect, Vermont State Medical Society, presiding. Out-of-state speakers include the following: Louis M. Lyons, L.H.D., and Drs. William Malamud, Paul M. Zoll, William V. McDermott Jr., Sara M. Jordan, Joe V. Meigs, Siegfried J. Thannhauser, Frank C. Wheelock Jr., and John L. Tullis, Boston; James W. Rae Jr., Ann Arbor, Mich.; Alvan L. Barach, New York City; and William F. Croskery, Brookline, Mass. Speaker at the the annual banquet, 7 p. m., Sept. 20, will be Richard D. Weigle, Ph.D., president of St. John's College, Annapolis, Md., who will present "Education: Appraisal and Prognosis." Entertainment includes a golf tournament Sept. 19. Exhibits and a ladies' program are arranged. For information write Dr. Warren H. Butterfield, Secretary-Treasurer, New Hampshire Medical Society, Concord, N. H.

Award for Investigations in Psychiatry.—The Society of Biological Psychiatry is offering an annual award which was made possible by the A. E. Bennett Neuropsychiatric Research Foundation. The award will consist of traveling expenses to the annual meeting plus expenses at the meeting, in addition to an honorarium of $250. It will preferably be given to a young investigator and not necessarily a member of the society for work which has been recently accomplished and not published. Papers should be submitted in quadruplicate to Arthur A. Ward, School of Medicine, University of Washington, Seattle 5, Wash., or to Dr. Harold E. Himwich, Chairman, Committee of Award, Galesburg State Research Hospital, Galesburg, Ill. Deadline for manuscripts is April 30, 1959.

Society News.—Officers of the **American Therapeutic Society** for 1958-59 are: president, Dr. Tom D. Spies, Birmingham, Ala.; vice-presidents, Drs. George E. Burch Jr., New Orleans, George C. Griffith, Los Angeles, and Frank B. Kelly, Chicago; secretary, Dr. Oscar B. Hunter Jr., 915-19th St. N. W., Washington, D. C.; and treasurer, Dr. Joseph A. Davis, Chicago.——The following officers of the **American College of Chest Physicians** have been elected for the year 1958-1959: president, Dr. Donald R. McKay, Buffalo, N. Y.; president-elect, Dr. Seymour M. Farber, San Francisco; first vice-president, Dr. Mathew J. Flipse, Miami; second vice-president, Dr. Hollis E. Johnson, Nashville, Tenn.; treasurer, Dr. Charles K. Petter, Waukegan, Ill.; assistant treasurer, Dr. Albert H. Andrews Jr., Chicago; chairman, board of regents, Dr. John F. Briggs, St. Paul; and historian, Dr. Carl C. Aven, Atlanta, Ga.

Program for Medical Research.—The National Fund for Medical Education has established a Medical Research Program through which contributions from united funds, community chests, voluntary health agencies, and other organizations will be channelled into basic research, to "help advance the search for basic medical knowledge . . . encourage the training of research personnel [and] help the nation's medical schools and other qualified institutions maintain a proper balance between basic and 'project, or applied, research.'" Fund grants are unrestricted but are used primarily for support of teaching budgets of the medical schools. Details of the new program have been worked out by a committee including Dr. Vernon W. Lippard, dean, Yale University School of Medicine, as chairman. The National Fund for Medical Education was formed in 1949 under the leadership of President Dwight D. Eisenhower, then president of Columbia University; former President Hoover, who is honorary chairman of the fund's board of trustees; educators, university presidents, and prominent business leaders. The fund recently awarded $3,178,825 to the medical schools, bringing to $15,843,766 the total awarded since its first grants were made in 1949.

Medical History Essay Contest.—The William Osler Medal of the American Association for the History of Medicine is awarded annually for the best unpublished essay on a medico-historical subject written by a student in one of the medical schools of the United States or Canada. This medal commemorates the great physician, Sir William Osler (1849-1919). Essays submitted should not exceed 10,000 words in length, and should demonstrate either original research or an unusual understanding of a medico-historical problem. It is expected that the student will seek help only from faculty advisors and from sources open to all investigators, such as libraries and museums. The prize-winning essay may be considered for publication in the *Bulletin of the History of Medicine*, the official organ of the association. All students are eligible and may submit essays at any time up to the next entry date after graduation. The next entry date terminates April 1, 1959. Essays should be submitted to Dr. Samuel Radbill, 7043 Elmwood Ave., Philadelphia 42.

Meeting on Anesthesiology in Vermont.—The first regional conference of the New England Society of Anesthesiologists will be held Sept. 18-19 at the Equinox House, Manchester-in-the-Mountains, Vermont, under the theme "Old and New Problems in Anesthesia." Keynote speaker will be Dr. Emanuel M. Papper, professor of anesthesiology, Cornell University Medical College, New York City. Five papers will be presented at each of the two sessions. Technical exhibits are planned. Entertainment includes a golf tournament and the annual banquet Sept. 19, 7:30 p. m. Registration fee for nonmembers is $5. For information write Dr. Thomas K. Burnap, Secretary, New England Society of Anesthesiologists, 721 Huntington Ave., Boston 15.

Conference on Electrical Techniques in Medicine.—The 11th annual Conference of Electrical Techniques in Medicine and Biology will be held in the Nicolett Hotel, Minneapolis, Nov. 19-21, sponsored by the American Institute of Electrical Engineers, the Institute of Radio Engineers, and the Instrument Society of America. Theme of the meeting is "Biology and Computers." One special session will be on the possibility of applying electronic computers to the theoretical and clinical problems of electrocardiography. The session will examine the ways in which a physician can be aided in making rapid and accurate diagnosis through the use of electronic computers. Another session will be devoted to computer ideas as applied to electroencephalography, and a third special session will be on the inverse problem of developing computer application on the basis of biological coding, biological transducer designs, and biological logic. The meeting is open to all scientists, engineers, and physicians. For information write The American Institute of Electrical Engineers, % Raymond C. Mayer & Associates, 36 W. 46th St., New York City 36.

Meeting of American Medical Colleges in Philadelphia.—The 69th annual meeting of the Association of American Medical Colleges will be held Oct. 13-15 at the Sheraton Hotel, Philadelphia. The presidential address, "The Problem of Change," will be given by Dr. Lowell T. Coggeshall, Chicago. A panel discussion, with James B. Conant, Litt.D., Boston, presiding, will be held on "Medical Education and the University." Dr. Gunnar Gundersen, President, American Medical Association, will present "AMA and the Medical School Partnership." Papers by foreign participants are: "Graduate Medical Education in Europe," by Dr. John P. Sandblom, Lund, Sweden, and "The Dalhousie Postgraduate Program: An Experience in Continuing Medical Education," by Dr. Lea C. Steeves, Dalhousie University, Nova Scocia, Canada. At the annual dinner, Oct. 13, 7 p. m., Dr. Conant will give the first Alan Gregg Lecture. For information write the Association of American Medical Colleges, 2530 Ridge Ave., Evanston, Ill.

Medical Scientists Visit Soviet Union.—Three American medical scientists started a visit in the Soviet Union Aug. 11 in a new exchange program sponsored by the American Friends Service Committee. They are Dr. Joseph Stokes Jr., Philadelphia; Dr. George A. Perera, New York City; and Samuel A. Corson, Ph.D., Little Rock, Ark. The group traveled in the Soviet Union until Sept. 9. The project, undertaken by the Quaker Organization, was arranged in cooperation with VOKS (Union of Soviet Societies for Cultural Relations with Foreign Countries) and the Soviet Embassy in Washington. The three men attended sessions of the International Congress for Microbiology in Stockholm before going to the Soviet Union. After leaving Russia they stopped in Poland for visits with Polish doctors and scientists. Dr. Stokes is president of the American Pediatric Society, professor of pediatrics at the University of Pennsylvania School of Medicine, and physician-in-chief of Children's Hospital. Dr. Perera is a member of the American Board of Internal Medicine, professor of medicine at the College of Physicians and Surgeons of Columbia University, and chairman of Friends Medical Society. Dr. Corson, who speaks fluent Russian, is associate professor of physiology and pharmacology at the University of Arkansas School of Medicine. The American Friends Service Committee is a world-wide Quaker peace and human welfare agency, with a national office in Philadelphia and 11 regional offices in the United States. It has programs in more than a dozen foreign countries.

FOREIGN

Cholera Outbreak in Nepal.—Cholera has broken out in Khatmandu, capital of Nepal, the first cholera epidemic to strike this Himalaya mountain nation in over half a century, according to word received at World Health Organization headquarters. At the request of the Government of Nepal, WHO is supplying 25,000 doses of vaccine to help immunize the population. Cases and deaths are twice as numerous as last year in India and East Pakistan, and an epidemic has struck Thailand for the first time in many years. Cholera has also been recorded in Cambodia and Burma. Cumulative totals for 1958 are, as of 31 July:

	Cases	Deaths
India	29,372	12,851
East Pakistan	10,386	6,644
Thailand	8,964	1,190
Cambodia	3	0
Burma	4	2
	48,729	20,687

Any person coming from an infected area, whether or not he is in possession of a vaccination certificate against cholera, may be placed under surveillance for a maximum of five days. If the traveller is not in possession of such a certificate, he may be placed in isolation for the five-day period.

CORRECTION

Appoint Dr. Wagner to Cardiovascular Research Chair.—Concerning an item published under this title in medical news Aug. 9, page 1854 of The Journal, in which it is stated that Dr. Bernard M. Wagner will be assistant professor of pathology at the University of Washington, Seattle, Miss Elizabeth J. Dictor, librarian, the Children's Hospital of Philadelphia, where Dr. Wagner was pathologist, has written that "Dr. Bernard M. Wagner will be associate professor."

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Oral Examination.* San Francisco, Sept. 29-Oct. 3, and Phoenix, April 5-10, 1959. The 1959 written examination will be given in various locations in the United States and Canada, July 17. The final date for filing application for the 1959 written examination is six months prior to the examination. There is no filing deadline for oral examinations. Sec., Dr. Curtiss B. Hickcox, 217 Farmington Ave., Hartford 8, Conn.

American Board of Dermatology: *Written. Several Cities,* June 30. *Oral.* Detroit, Oct. 17-19. Final date for filing all applications is April 1. Sec., Dr. Beatrice Maher Kesten, One Haven Ave., New York 32.

American Board of Internal Medicine: *Written.* Oct. 20, 1958. *Oral.* Chicago, Oct. 13-16. *1959 Schedule—Written,* Oct. 19. Final date for filing application is May 1. *Oral.* For candidates in the South and Southwest, New Orleans, Feb. 3-6. Final date for filing application is Jan. 1. *Oral.* For candidates in the Midwest. Chicago, April 15-18. Final date for filing application is Jan. 1. *Oral.* For candidates on the West Coast. Final date for filing application is March 1. *Oral.* For candidates on the East Coast, Nov. 6-7, 9-10. Final date for filing application is March 1. *Examination in the Subspecialties. Gastroenterology.* Philadelphia, April 17-18. Final date for filing application is Feb. 1. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

American Board of Obstetrics and Gynecology: Applications for certification, new and reopened, Part I, and requests for re-examination Part II, are now being accepted. All candidates are urged to make such application at the earliest possible date. Deadline date for receipt of application is September 1, 1958. No application can be accepted after that date. It should be noted by prospective candidates that the deadline date in 1959 is August 1. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written,* qualifying test (Part I), January 1959. Final date for filing application was July 1, 1958. *Oral Examinations 1958* (Part II): Chicago, Oct. 6-10. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland, Maine.

American Board of Orthopaedic Surgery: *Part II.* Chicago, Jan. 21-23, 1959. Deadline for receipt of applications was Aug. 15. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 6-10. Final date for filing application was April 30. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pathology: Chicago, Oct. 30-Nov. 1. Final date for filing application is Sept. 30. Sec., Dr. Edward B. Smith, Indiana University Medical Center, 1100 W. Michigan St., Indianapolis 7.

American Board of Pediatrics: *Oral.* Chicago, Oct. 24-26 and New York, Dec. 5-7. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

American Board of Plastic Surgery: *Oral and Written.* Chicago, Oct. 9-11. Final date for receipt of case reports was July 1. Corresponding Secretary, Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

American Board of Preventive Medicine: *Examination in Public Health.* St. Louis, Oct. 24-26. Final date for filing application was Aug. 15. Sec., Dr. Thomas F. Whayne, 3438 Walnut St., Philadelphia 4.

American Board of Proctology: *Oral and Written, Parts I and II.* September 1958. Final date for filing application is March 15. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

American Board of Psychiatry and Neurology: New York City, Dec. 15-16; New Orleans, Mar. 16-17. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 will be terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

American Board of Radiology: *Regular Examination.* Washington, D. C., Dec. 8-11. Final date for filing application was July 1. *Special examination in Nuclear Medicine—for those diplomates in Radiology or Therapeutic Radiology.* Washington, D. C., Dec. 6. Final date for filing application is Oct. 1. *Special Examination.* Cincinnati, Mar. 16-19, 1959. Final date for filing application is Nov. 1. Candidates completing training June 30, 1959 are not eligible for the Spring 1959 examinations. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: Written examinations (Part I) will be held at various centers in the United States, Canada, Hawaii, Puerto Rico, and certain military centers abroad on December 3. The date of the Fall examination in *Part I* has been changed from the last Wednesday of October as announced in its current Booklet of Information to December 3, 1958. Thereafter, examinations in Part I will be held once annually, on the first Wednesday of December. The closing date for filing applications will be August 1. *Part II.* Philadelphia, Sept. 15-16; Rochester, Minn., Oct. 20-21; Nashville, Tenn., Nov. 17-18; New York City, Dec. 15-16; Houston, Tex., Jan. 12-13; New Haven, Conn., Feb. 9-10; Durham, No. Car., March 9-10; San Francisco, April 13-14; Indianapolis, May 11-12; Columbus, Ohio, May 14-15. Sec., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

Board of Thoracic Surgery: Various centers throughout the United States. *Written.* Spring of 1959. Final date for filing application is December 1. Sec., Dr. Wm. M. Tuttle, 1151 Taylor Avenue, Detroit 2.

American Board of Urology: *Written Examination.* Twenty-five cities throughout the country, Dec. 5. The oral will be given in Chicago in February 1959. Sec., Dr. William Niles Wishard, Jr., 30 Westwood Road, Minneapolis 26.

DEATHS

Adams, Jesse Lee Jr., Reno, Nevada; Georgetown University School of Medicine, Washington, D. C.; 1898; died in St. Mary's Hospital July 16, aged 83, of coronary occlusion.

Alexander, Horace Knox Ⓜ Fayetteville, Tenn.; University of Nashville (Tenn.) Medical Department, 1909; served overseas during World War I; died in the Lincoln County Hospital July 15, aged 72, of cerebrovascular accident.

Allum, Arthur Wesley, Glendale, Calif.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1903; specialist certified by the American Board of Obstetrics and Gynecology; an associate member of the American Medical Association; served as president of the Glendale Branch of the Los Angeles County Medical Association; fellow of the American College of Surgeons; on the staff of the Memorial Hospital; died in St. John's Hospital, Santa Monica, July 20, aged 78, of myocardial infarction and coronary thrombosis.

Branch, Frederick Douglas, Binghamton, N. Y.; Albany (N. Y.) Medical College, 1899; an associate member of the American Medical Association; served on the staffs of the Binghamton City and Binghamton State hospitals; died July 19, aged 84.

Brenner, Edward Christopher, New York City; Columbia University College of Physicians and Surgeons, New York City, 1908; member of the founders group of the American Board of Surgery; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; formerly chairman of the medical board of the New York City Department of Correction; at one time associate professor of clinical surgery at New York Post-Graduate Medical School; served on the staffs of the Midtown and Riker's hospitals; died in Butler, Pa., July 24, aged 73.

Bunge, Charles Albert, Bland, Mo.; Barnes Medical College, St. Louis, 1910; past-president of the Gasconade County Medical Association; formerly mayor, school board member, and county coroner; died July 22, aged 79, of heart disease.

Burner, Allen Eugene, Durbin, W. Va.; College of Physicians and Surgeons, Baltimore, 1908; died July 23, aged 81, of a heart attack.

Butz, Joseph Aaron, Los Angeles; Bennett Medical College, Chicago, 1902; died July 15, aged 80, of coronary disease and arteriosclerosis.

Carbonell, Arturo Ⓜ Colonel, U. S. Army, retired, Arlington, Va.; Jefferson Medical College of Philadelphia, 1911; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; service member of the American Medical Association; veteran of World Wars I and II; entered the regular Army in 1917 and retired Aug. 31, 1948; chief of the medical service at West Point for many years; died in the Walter Reed Army Hospital, Washington, D. C., July 16, aged 69, of acute myocardial infarction.

Conner, Elwin Iris, Pomona, Calif.; University of Nebraska College of Medicine, Omaha, 1926; at one time a medical missionary in West Africa; veteran of World War II; hanged himself July 20, aged 60.

Crosby, Roy Campbell Ⓜ Boise, Idaho; Tufts College Medical School, Boston, 1944; certified by the National Board of Medical Examiners; in the military service from Feb. 1, 1954, to Nov. 19, 1955; associated with St. Luke's and St. Alphonsus hospitals; died in Marlboro, Mass., July 20, aged 39, of injuries received in a private plane crash.

de Steiguer, John Rodolph Ⓜ San Marcos, Texas; Hospital College of Medicine, Louisville, Ky., 1890; died May 8, aged 88, of cancer.

Devine, Winifred Morrill Woolls, Lowell, Mass.; Boston University School of Medicine, 1908; retired school physician for the city of Lowell; died July 18, aged 78, of coronary thrombosis.

Dimmitt, Egbert King Ⓜ Farmington, Ill.; University of Louisville (Ky.) Medical Department, 1909; vice-president of the Bank of Farmington; charter member and past-president of the Farmington Rotary Club; associated with the Graham Hospital in Canton and the Methodist Hospital of Central Illinois in Peoria, where he died July 4, aged 75, of arteriosclerotic heart disease.

Dorsey, George Hamilton Ⓜ Major, U. S. Army, retired, Wheat Ridge, Colo.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1915; service member of the American Medical Association; member of the American Urological Association; entered the regular Army in 1918 and retired Dec. 15, 1922; died in Reno, Nevada, July 6, aged 65, of congestive heart failure and pneumonitis.

Edstrom, Henry, Springfield, Ill.; University of Minnesota Medical School, Minneapolis, 1926; specialist certified by the American Board of Radiology; member of the American College of Radi-

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Ⓜ Indicates Member of the American Medical Association.

ology; veteran of World War II; died July 17, aged 58, of acute coronary occlusion and myocardial infarction.

Ekwurzel, George Macy Ⓜ Colonel, U. S. Army, retired, San Francisco; University of Pennsylvania Department of Medicine, Philadelphia, 1897; service member of the American Medical Association; fellow of the American College of Surgeons; entered the regular Army in 1901 and retired May 31, 1939; veteran of World War I; died in the Letterman Army Hospital June 21, aged 83.

Eyestone, Fred Levi Ⓜ Toledo, Ohio; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1916; fellow of the American College of Surgeons; veteran of World War I; served on the staffs of the Toledo, Riverside, and St. Vincent's hospitals, and the Mercy Hospital, where he died July 20, aged 65, of cancer.

Gibson, Stewart Merrill Ⓜ Southbridge, Mass.; Tufts College Medical School, Boston, 1928; on the staff of the Harrington Memorial Hospial; died in Sturbridge July 16, aged 54, of coronary thrombosis.

Goldenberg, Marcellus Ⓜ New York City; Medizinische Fakultät der Universität, Vienna, Austria, 1926; specialist certified by the American Board of Internal Medicine; assistant clinical professor of medicine at the Columbia University College of Physicians and Surgeons; credited with having discovered the presence of nor-epinephrine in the adrenal gland; associated with the Presbyterian Hospital, where he died July 30, aged 57, of myocardial infarction.

Gordon, Charles Howard Ⓜ Portland, Maine; Medical School of Maine, Portland, 1919; specialist certified by the American Board of Otolaryngology; past-president of the Cumberland County Medical Society; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; consultant at the Webber Hospital in Biddeford; on the staffs of the Maine General Hospital and the Maine Eye and Ear Infirmary, where he was chief of the ear, nose and throat service; died July 28, aged 64, of ruptured aortic aneurysm.

Haines, Charles Tomlinson, Ambler, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1898; died in Doylestown July 22, aged 86, of adenocarcinoma of the prostate and arteriosclerosis.

Herzon, Herbert, San Francisco; born in Chicago Jan. 5, 1921; University of Illinois College of Medicine, Chicago, 1944; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; on the faculty of the University of California School of Medicine; an officer in the medical corps of the Army of the United States from 1945 to 1947; served an internship and residency at the Cook County Hospital in Chicago; served a residency at the Municipal Contagious Disease Hospital, in Chicago, and the Langley Porter Clinic Hospital, where he was a member of the staff; died in the Palo Alto (Calif.) Hospital July 18, aged 37.

Horton, Ray Beaman Ⓜ North Kansas City, Mo.; Kansas City (Mo.) College of Medicine and Surgery, 1922; Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest, Hungary, 1924; assistant to the president of the Kansas City Southern Lines; died July 19, aged 58.

Irwin, Henderson, Eureka, N. C.; University of Maryland School of Medicine, Baltimore, 1912; member of the Medical Society of the State of North Carolina and the American Academy of General Practice; for many years chairman of the board of education of Eureka; died in the Woodard–Herring Hospital, Wilson, July 19, aged 74, of carcinoma of the prostate.

Johnston, Cecil Fredrick Ⓜ Bluefield, W. Va.; Medical College of Virginia, Richmond, 1929; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; associated with the Bluefield Sanitarium; died July 21, aged 54, of coronary occlusion.

Levant, Benjamin Ⓜ Pittsburgh; University of Pittsburgh School of Medicine, 1921; specialist certified by the American Board of Urology; member of the American Urological Association and past-president of the Mid-Atlantic Section; fellow of the American College of Surgeons and the International College of Surgeons; instructor in urology at the University of Pittsburgh School of Medicine; associated with Montefiore Hospital, where he died July 28, aged 60, of coronary disease.

Logan, George W. Ⓜ Hastings, Mich.; Saginaw Valley Medical College, Saginaw, 1901; served on the staffs of the Hurley, McLaren General, and St. Joseph hospitals in Flint; died in Flint July 16, aged 81, of arteriosclerosis.

Lombardo, Bartlo William Ⓜ Newark, N. J.; New York Medical College, Flower and Fifth Avenue Hospitals, New York City, 1941; certified by the National Board of Medical Examiners; veteran of World War II; associated with St. James and Columbus hospitals, and the Clara Maass Hospital, where he died July 13, aged 41, of cancer.

Lyle, James McCampbell Ⓜ Lewiston, Idaho; University of Nashville (Tenn.) Medical Department, 1901; veteran of World War I; medical examiner for the Nez Perce County Selective Service during World War II; on the staff of St. Joseph's Hospital;

served as county health officer and health officer for the city; died in the Gritman Memorial Hospital, Moscow, July 11, aged 81, of pneumonia.

Manglesdorf, William F., Little Rock, Ark.; College of Physicians and Surgeons, Little Rock, 1910; died July 6, aged 79.

Marble, Ira Albertus, Mason City, Iowa; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1907; died July 4, aged 79, of heart disease.

McNealy, Raymond William Ⓜ Chicago; born in Chambersburg, Mo., Aug. 17, 1886; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; member of the founders group of the American Board of Surgery; served on the faculty of his alma mater and Northwestern University Medical School; professor of surgery and secretary-treasurer of the Cook County Graduate School of Medicine; member of the board of trustees of the Hektoen Institute for Medical Research of Cook County Hospital, of which he was formerly secretary-treasurer; one of the founders and honorary fellow of the International College of Surgeons and chairman of the United States qualifications board; fellow of the American College of Surgeons; president of the Illinois Surgical Society; past-president of the Chicago Surgical Society; president of the United Research Foundation; member of the board of public health advisors, department of public health, state of Illinois; member of the advisory board of the Chicago Health Department; member of the medical advisory board of the Cancer Research Foundation; member of the Western Surgical Association, Pan-Pacific Surgical Society, Southern Surgical Society, Institute of Medicine of Chicago. Alpha Omega Alpha, Alpha Kappa Kappa, and Phi Kappa Epsilon; veteran of World War I; Commander, Legion of Merit–Juan Pablo Duarte, Dominican Republic; in 1941-1942 trustee of Northwestern University; formerly on the editorial board, *Illinois Medical Journal;* president of the attending staff, Cook County Hospital; consulting surgeon at the Illinois Masonic Hospital, Oak Forest (Ill.) Infirmary, and the Kenner Hospital; in 1924 appointed attending surgeon at St. Luke's Hospital; chairman emeritus, department of surgery, and a member of the senior attending staff, Chicago Wesley Memorial Hospital, where he died July 29, aged 71, of cerebral hemorrhage and cardiovascular disease.

Merritt, Francis Elmer, Akron, Ohio; Ohio State University College of Medicine, Columbus, 1934; member of the Ohio State Medical Association; died in the Barberton Citizens Hospital May 21, aged 48.

Meyer, Joseph Theodore Ⓜ Chicago; Chicago College of Medicine and Surgery, 1913; fellow of the American College of Surgeons; veteran of World War I; member of the president's council and formerly on the faculty of Stritch School of Medicine of Loyola University; in 1951 was elected president of its alumni association; served as president of the staff and chief surgeon of St. George Hospital, where he died July 29, aged 72, of cerebral hemorrhage.

Montgomery, Claude William Ⓜ Sycamore, Ohio; Ohio Medical University, Columbus, 1900; veteran of World War I; formerly member of the board of education; a director and past-president of the board of directors of the First National Bank of Sycamore; past-president of the Sycamore Telephone Company; staff member of the Mercy Hospital in Tiffin; died in the Wyandot Memorial Hospital, Upper Sandusky, July 7, aged 87, of senility.

Moore, Benjamin B. Ⓜ Indianapolis; Indiana University School of Medicine, Indianapolis, 1920; fellow of the American College of Surgeons; past-president of the Indianapolis Medical Society; associated with Methodist and St. Vincent's hospitals; on the visiting staff, Indianapolis City Hospital; died near Petoskey, Mich., July 13, aged 62.

Murphy, Dennis John Ⓜ Washington, D. C.; Tufts College Medical School, Boston, 1910; service member of the American Medical Association; formerly on the staffs of the Veterans Administration hospitals in Marion, Ind., and Chillicothe, Ohio; veteran of World Wars I and II; served as member of the Veterans Administration pension board; died July 20, aged 71.

Newman, Frederick Jacob, New York City; Columbia University College of Physicians and Surgeons, New York City, 1903; an associate member of the American Medical Association; died in Larchmont, N. Y., July 5, aged 78, of coronary disease.

Oakes, Frederick Ⓜ Schiller Park, Ill.; Bennett Medical College, Chicago, 1915; associated with West Suburban Hospital, Oak Park, and Westlake Hospital in Melrose Park, where he died July 28, aged 72, of myocardial infarct.

Pace, William Thomas, Gray Court, S. C.; Medical College of South Carolina, Charleston, 1915; member of the South Carolina Medical Association; for many years on the staff of the Laurens County Hospital in Laurens; died July 6, aged 69, of heart disease.

Pagett, Frank Elmer, Oakland, Calif.; Columbia University College of Physicians and Surgeons, New York City, 1896; at one time practiced in Spring Valley, N. Y., and served as health officer of Rockland County; served as chief of staff at Good Samaritan Hospital in Suffern, N. Y.; died in the Peralta Hospital, July 1, aged 85, of uremia.

Peirce, Bradford Hendrick Ⓜ Hanson, Mass.; Harvard Medical School, Boston, 1906; member of the American Trudeau Society; at one time practiced in Cambridge, where he was health officer; veteran of the Spanish-American War and World War I; served as superintendent and director of the Plymouth County Hospital in South Hanson; died in Brockton (Mass.) Hospital July 16, aged 78, of heart disease.

Plummer, John Owen, Raleigh, N. C.; Leonard Medical School, Raleigh, 1904; died in Durham July 4, aged 78, of myocardial infarction.

Pratt, Frederick Haven, Wellesley Hills, Mass.; Harvard Medical School, Boston, 1906; served as professor emeritus of physiology at Boston University School of Medicine; formerly on the faculty of Wellesley (Mass.) College, University of Buffalo, Clark, and Harvard universities; died July 11, aged 84, of complete heart block.

Quigley, James Earle, Edinburg, Ohio; University of Maryland School of Medicine, Baltimore, 1911; died May 13, aged 74.

Rankin, Pressly Robinson Ⓜ Mount Gilead, N. C.; North Carolina Medical College, Charlotte, 1910; for many years president of the Bank of Mount Gilead, member of the school board and president of the Mount Gilead Brick Company; treasurer of the United Mills Corporation; died in the Montgomery Memorial Hospital in Troy July 6, aged 72, of hepatic cirrhosis arterioscleroses with cerebrovascular accident.

Rivers, Thurston Donnell Ⓜ Montgomery, Ala.; Jefferson Medical College of Philadelphia, 1926; member of the American Psychiatric Association; died July 9, aged 60, of coronary occlusion and arteriosclerotic heart disease.

Sako, Wallace Saburo Ⓜ Raceland, La.; born in Hawaii Sept. 2, 1910; University of Minnesota Medical School, Minneapolis, 1936; certified by the National Board of Medical Examiners; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; served on the faculty of the University of Minnesota Medical School, Minneapolis, Louisiana State University School of Medicine in New Orleans, and University of Texas School of Medicine in Galveston; visiting physician at the Charity Hospital in New Orleans; pediatrician at Sako Clinic for Children; consultant in pediatrics, St. Anne's Hospital, Raceland, St. Joseph Hospital, Thibodaux, Terrebonne Parish General Hospital, Houma, and Southern Baptist Hospital in New Orleans; died July 5, aged 47.

Seldon, Frank Gustav Ⓜ Manchester, N. H.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1925; member of the American College of Chest Physicians, and past-president of the New England Chapter, and the American Trudeau Society; formerly associated with the New Hampshire State Sanatorium at Glencliff, and medical superintendent of the Edward Sanatorium in Naperville, Ill.; consultant, Notre Dame de Lourdes Hospital; member of the staff of Sacred Heart Hospital, where he died July 6, aged 59, of arteriosclerotic heart disease.

Sell, Frederick William, Rahway, N. J.; University of Cambridge Faculty of Medicine, England, 1894; past-president of the Union County Mosquito Extermination Commission; at one time health officer; formerly bacteriologist for the Rahway Water Commission; specialist certified by the American Board of Radiology; an associate member of the American Medical Association; served in France during World War I; served on the staffs of New Jersey Reformation Hospital and Rahway Hospital; died in the Alexian Brothers Hospital, Elizabeth, July 9, aged 88, of cerebrovascular accident.

Shanahan, William Henry Ⓜ Portland, Maine; University of Vermont College of Medicine, Burlington, 1912; died in the Veterans Administration Hospital, Togus, June 11, aged 72, of bronchogenic carcinoma with metastasis.

Shannon, Charles Edward Ⓜ Chicago; Rush Medical College, Chicago, 1926; specialist certified by the American Board of Surgery; fellow of the International College of Surgeons and American College of Surgeons; member of the Institute of Medicine of Chicago; veteran of World War I; director of the medical bureau of Marshal Field & Company; on the staff of St. Luke's Hospital; died July 18, aged 60, of coronary occlusion.

Shaul, Elmer Bryant Ⓜ Scranton, Pa.; Syracuse University College of Medicine, 1916; veteran of World War I; on the staff of the Hahnemann Hospital; died July 12, aged 71, of a heart attack.

Sicotte, Isaiah Ⓜ Ishpeming, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1907; practiced in Michigamme; served in France during World War I and received the Croix de Guerre from the French government; died in St. Mary's Hospital, Marquette, July 13, aged 79.

Smith, John William Rosser Ⓜ Charlottesville, Va.; University of Virginia Department of Medicine, Charlottesville, 1900; died July 19, aged 82.

Stansbury, Frank R., Cincinnati; Pulte Medical College, Homeopathic, Cincinnati, 1906; on the staff of the Bethesda Hospital; died July 16, aged 78.

Straith, Claire LeRoy Ⓜ Detroit; born in Harrow, Ont., Canada, Aug. 30, 1891; Rush Medical College, Chicago, 1917; also a D.D.S.; specialist certified by the American Board of Plastic Surgery; member of the American Association of Plastic Surgeons and the American Society of Plastic and Reconstructive Surgery; fellow of the International College of Surgeons and the American College of Surgeons; associated with Straith Memorial, Harper, Children's, Charles Godwin Jennings, Alexander Blain and Florence Crittendon hospitals in Detroit, and the Highland Park (Mich.) General Hospital; died in Glasgow, Scotland, July 13, aged 66.

Straub, Hiram Grant, Minersville, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1917; veteran of World War I; died July 4, aged 67.

Strickland, John Thomas ® Birmingham, Ala.; University of Pennsylvania School of Medicine, Philadelphia, 1946; member of the American Academy of General Practice; past-president of the Birmingham Chapter of the Alabama Academy of General Practice; veteran of World War II; died July 2, aged 42, of injuries received in an automobile accident.

Swanson, Ernest Bruce, Minneapolis; University of Minnesota Medical School, Minneapolis, 1956; served an internship and residency at the Pennsylvania Hospital in Philadelphia; captain and flight surgeon from 327th Air Force Dispensary at Truax Field, Madison, Wis.; killed July 14, aged 27, when a small private plane he was flying crashed near Mauston.

Swenson, Andrew Clay ® Waterbury, Conn.; Yale University School of Medicine, New Haven, 1902; formerly medical examiner of Middlebury; for many years treasurer of the Waterbury Medical Association; on the honorary staff in urology at the Waterbury Hospital, where he died July 19, aged 87.

Talbot, Clarence Weill ® Spokane, Wash.; University Medical College of Kansas City, Mo., 1906; died in the Deaconess Hospital July 1, aged 74, of general peritonitis following gastrectomy for chronic gastric ulcer.

Thomison, Samuel James Jr., Jarrettsville, Md.; University and Bellevue Hospital Medical College, New York City, 1944; certified by the National Board of Medical Examiners; member of the Medical and Chirurgical Faculty of Maryland; veteran of World War II; died in Baltimore July 16, aged 39, of congestive heart failure.

Trice, Leroy ® Palestine, Texas; University of Texas School of Medicine, Galveston, 1931; fellow of the American College of Surgeons; served as secretary-treasurer of the Anderson–Houston–Leon Counties Medical Society; died in the Memorial Hospital, Houston, July 7, aged 51, of hypertensive cardiovascular renal disease.

Vogel, Hymen Allen ® Garden City, Mich.; University of Michigan Medical School, Ann Arbor, 1926; member of the American Academy of General Practice; served as president of the school board; on the staffs of Providence and Mount Carmel hospitals in Detroit, Oakwood Hospital in Dearborn, and Annapolis Hospital in Wayne; died July 2, aged 57, of coronary thrombosis.

Wheeler, David Riddell ® Evanston, Ill.; University of Minnesota Medical School, Minneapolis, 1941; member of the American Psychiatric Association; died July 7, aged 49, of coronary occlusion.

Wheelihan, Robert York ® Riviera Beach, Fla.; Northwestern University Medical School, Chicago, 1928; member of the American Academy of General Practice; served as secretary of the Palm Beach County Medical Society; vice-president of St. Mary's Hospital in West Palm Beach; for many years practiced in Elm Grove, Wis.; formerly health officer for the townships of Brookfield and New Berlin in Wisconsin; died June 25, aged 54, of cancer.

White, William Henry, Banner, Ark. (licensed in Arkansas in 1904); died July 5, aged 77.

Whitehead, Seba L. ® Asheville, N. C.; Jefferson Medical College of Philadelphia, 1921; member of the American Academy of Dermatology and Syphilology; veteran of World War I; associated with Memorial Mission, St. Joseph's, and Aston Park hospitals; died July 12, aged 62, of a heart attack.

Wilkinson, Ernest A., Highmore, S. D.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1905; an associate member of the American Medical Association; died June 1, aged 81, of injuries received in an automobile accident.

Williams, Napoleon Kassire ® McCurtain, Okla.; St. Louis College of Physicians and Surgeons, 1918; member of the school board; on the staff of the LeFlore County Memorial Hospital in Poteau; died July 14, aged 67, of a heart attack.

Woolridge, John Hayes ® Clearfield, Pa.; Jefferson Medical College of Philadelphia, 1916; member of the American Urological Association; fellow of the American College of Surgeons; past-president of the Clearfield County Medical Society; veteran of World War I; served on the staff of the Clearfield Hospital, where he died July 4, aged 67, of coronary thrombosis.

Zanger, Carl Emil ® Chicago; Northwestern University Medical School, Chicago, 1920; veteran of World War I; died July 17, aged 63, of coronary thrombosis.

FOREIGN LETTERS

DENMARK

Antimalarial Drugs for Arthritis.—In four articles in *Ugeskrift for læger* for June 19, Dr. F. Erlendsson reported on the action of various antimalarial drugs on rheumatoid arthritis. The first dealt with 14 patients to whom quinacrine or chloroquine was given, this treatment having been started more than four years earlier. Good results could be claimed in eight. Some of the disappointments in the other patients were due to such side-effects as indigestion and a rash. The second article concerned 20 patients with active rheumatoid arthritis given chloroquine diphosphate whose dose corresponded to 300 to 450 mg. of chloroquine base daily. As a rule the maintenance dose was 150 to 300 mg. daily. The results were satisfactory in 16. The third article dealt with six patients with active rheumatoid arthritis treated with a combination of primaquine and chloroquine. In five the side-effects necessitated a reduction or complete withdrawal of the drugs. The fourth article dealt with the evaluation of therapeutic measures by controlled statistics. Erlendsson preferred the study of the individual patient because of the multiplicity of unknown elements in rheumatoid arthritis.

Old Age and Work.—Dr. Mogens Felbo published a thesis entitled "Old Age and Work." It deals with the relation between the condition of the limbs and capacity for work in 65-year-old and 70-year-old natives of the Danish island of Bornholm. The 974 persons of both sexes belonging to these two age groups submitted to a searching medical examination which showed that loss of muscle strength was more common in laborers engaged in heavy work than in others, that the former suffered more from reduced mobility of the joints, and that while 17.3% of the men had some deformity of the feet, this was the case with 44% of the women. Ulcus cruris was found in 6%, the incidence in women being twice that in men. Arteriosclerosis of the femoral artery was found in 23% of the 65-year-old and in 35% of the 70-year-old men, the corresponding figures for women being much smaller.

Orphenadrine for Parkinsonism.—Dr. P. Berggreen (*Ugeskrift for læger,* June 5, 1958) found orphenadrine to be so effective in treating Parkinsonism that only when it fails is it replaced or given with some other drug. In his series of 25 patients he gave 3 to 12 tablets of 50 mg. daily. The usual dosage was 5 to 7 tablets daily, and, though 12 tablets were well tolerated, no improvement followed raising the dosage over 8 tablets daily. The side-effects were never so serious as to necessitate withdrawal of the drug, and they consisted of dryness of the mouth in 19 patients, blurred vision in 3, smarting of the eyes in 4, constipation in 7, and slight dyspepsia in 6. Altogether 16 patients showed varying degrees of improvement, 8 were not improved, and 1 was made worse. Practically all the patients showing improvement preferred this drug to others they had tried. On this drug the patient's general condition usually improves, he becomes more cheerful and more mobile, but there is no improvement in the tremor.

Herniation of the Nucleus Pulposus.—At a meeting of the Danish Society for Rheumatism Research (*Nordisk medicin,* June 12, 1958) more than one series of statistics concerned with the late effects of operations for herniation of the nucleus pulposus were presented. One speaker insisted that the factors determining the final issue were so varied that the subject did not lend itself to statistical analysis. The material presented by Larsen and Kristoffersen concerned 49 patients operated on in 1950 and 1951 and reexamined five years later. Roughly 50% were found to be completely symptom-free, while the rest still had some pain. Several of the former still presented severe, radiologically demonstrable lesions of the lumbar spine. In another series, presented by J. Saugmann-Jensen, 149 patients were examined from one and one-half to three and one-half years after operation. In 118, complete fitness for work had been achieved, 23 were partially fit for work, and 8 were unfit for work or had had to be operated on again. Broadly speaking, the operation takes the top off the pain, but does not necessarily effect a complete cure.

Health Hazards in Antibiotic Factory.—In 1954 many employees of a Danish antibiotics factory, engaged in penicillin crystallization or streptomycin purification, complained of headache, irritation of the eyes and respiratory passages, and rashes which might be traceable to their occupation. This led to the appointment of Dr. B. Heilesen as medical officer of the factory with the task of supervising the health of its employees. He reported (*Ugeskrift for læger,* June 19, 1958) that in the course of three

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The items in these letters are contributed by regular correspondents in the various foreign countries.

years more than half the cases about which he was consulted were dermatological, largely concerned with streptomycin sensitivity and with penicillin sensitivity, 35 and 10 cases respectively. The reactions were usually eczematous, but in eight of those with streptomycin allergy the reaction took the form of asthma and vasomotor rhinitis. A woman packer of insulin who suffered from urticaria, vasomotor rhinitis, and asthma was cured of these reactions when she ceased work but relapsed on returning to it. Streptomycin was being packed in the same room, and the breaking of ampules containing it was presumably responsible for her symptoms. Heilesen's recommendations are largely prophylactic—the questioning of prospective employees for the most hazardous areas with regard to an earlier history of allergy so that they can be dissuaded from exposing themselves to drug allergy, and mechanizing the packing so that there is as little personal contact as possible with the drugs in question.

FRANCE

Treatment of Acute Leukemia.—R. Picard and co-workers (*Presse méd.* 66:1064, 1958) treated 11 patients who had leukemia (6 acute and 5 chronic) with prednisone. A follow-up for about two years and the addition of 19 further cases have made possible more substantial conclusions than those previously reported. The effects on the temperature and the general condition were spectacular. The osteoarticular pains were relieved except in those with localized foci who on the other hand responded remarkably to local radiotherapy. The effect on the blood picture however could not be easily assessed owing to the fact that blood transfusions were also given. It was, however, possible to effect a definite improvement in the red and white blood cell counts with prednisone alone and even to get a complete normalization of the hemogram. Furthermore, the functional remission was complete, thus affording the patients a feeling of full recovery.

Hypocholesterolergic Drug.—J. L. de Gennes and co-workers (*Presse méd.* 66:1108, 1958) stated that evaluation of the hypocholesteremic action of any drug requires (1) a strict selection of the types of hypocholesteremia susceptible of being beneficially investigated, (2) the assessment of an adequate stability in the basic cholesteremia and to the previous determination of its gradients in technical and biological fluctuations, and (3) the ruling out of mere chance as the cause of the fall of the cholesteremia. These requirements were met in the study of a new hypocholesteremic agent (6782). The results obtained indicated a hypocholesteremic effect over a short period.

INDIA

Mecamylamine in Hypertension.—Shah and Shah (*Medical Bulletin,* vol. 3, June 1, 1958) stated that mecamylamine hydrochloride was introduced in the therapy of hypertension as a ganglion blocking agent and acts by blocking the transmission of nerve impulses through both sympathetic and parasympathetic ganglia by raising the threshold of ganglion cells to stimulation. The authors gave this drug to 10 patients with hypertension. All were hospitalized till the maintenance dose was adjusted, and then they were followed as outpatients. The initial dose was 2.5 mg. twice a day and was gradually increased every second or third day till the blood pressure was adequately lowered. All of the patients also received 1 mg. of reserpine daily. The average period of hospitalization required for these patients was five to seven days, and the average maintenance dose was found to be 7.5 to 10 mg. a day in three divided doses. The largest dose given was 45 mg. in 24 hours, and even this dose did not produce any toxic effects.

Results were assessed by the degree of fall in blood pressure, and the criterion of success was the blood pressure response in the upright position without undue giddiness; 9 of the 10 patients responded well to this drug, especially as far as the blood pressure in the upright position was concerned. Symptomatic relief was produced in most patients with regression of blood pressure. The average initial systolic pressure was 210 mm. Hg in the flat and 201 mm. Hg in the upright position. The respective diastolic readings were 123 and 117 mm. Hg. After treatment, these values came down to 174 and 159 mm. Hg systolic and 107 and 99 mm. Hg diastolic. Thus the average systolic fall in the recumbent position was 36 mm. Hg and in the upright position 42 mm. Hg, while the diastolic fall in the two positions was 16 and 18 mm. Hg respectively. The response was maximal in the upright position. Toxic effects observed were constipation, distention, diarrhea, dryness of the mouth, blurring of vision, and giddiness, but in no patient were they severe enough to necessitate cessation of treatment. The drug is especially useful for symptomatic treatment of severe and malignant hypertension.

Urinary Excretion of 17-Ketosteroids in Leishmaniasis.—Chatterjee and Sen Gupta estimated the urinary 17-ketosteroid level in 16 patients with visceral leishmaniasis on admission to hospital and again in 11 after completion of treatment (*Journal of the Indian Medical Association,* vol. 31, July 1. 1958). The patients' ages varied between 10 and 57 years. The diagnosis was confirmed in all cases by the presence of Leishmania donovani in bone marrow, spleen, or liver. Complement fixation and aldehyde tests were also positive in all patients. All of them showed anemia and leukopenia. They were judged as recovered when the fever disappeared, there was gain in weight, the size of spleen was reduced, and the blood findings returned to near normal levels. In all the excretion of urinary 17-ketosteroids was below normal.

Urinary 17-ketosteroid level estimation is a method of assessing the adrenocortical function, but, as about 30% of the total 17-ketosteroids excreted may be accounted for by testicular secretion, the lowered level in leishmaniasis may be due to adrenocortical and/or gonadal hypofunction. Leishmaniasis is associated with a fair degree of malnutrition which was seen in almost all the patients in this series, along with anemia, leukopenia, and low blood pressure. 17-ketosteroids excretion in the urine is diminished in undernourished persons with or without evidences of malnutrition, and this may be one of the factors responsible for its reduced level in leishmaniasis. In two patients in whom the general condition was fair and the anemia slight, the urinary 17-ketosteroid excretion was less depressed than in the others. In the 11 patients, where it was also estimated after recovery, a distinct increase in excretion was noticed, although the values had not returned to normal in all of these.

Tubeless Gastric Analysis.—Chowdhary and Banerjee (*Indian Medical Forum*, vol. 9, May, 1958) stated that the passage of a Ryle's tube for gastric analysis may prove difficult in nervous patients and is likely to cause some discomfort. As an alternative procedure, a tubeless technique for determining the amount of free hydrochloric acid in the stomach with quinine resin is used. This resin, when given orally, reacts with the free hydrochloric acid of the stomach as a result of which quinine is excreted in the urine. This can be extracted and estimated by measuring its fluorescence in ultraviolet light. The amount of urinary quinine thus estimated indicates the amount of free hydrochloric acid in the stomach.

The authors used this method in 10 patients who were also subjected to a fractional test meal and in whom a Ryle's tube was used, and the results were compared. These patients included six with radiologically confirmed peptic ulcer, all of whom had high acid curves on fractional test meal analysis. All these patients also showed a high excretion of urinary quinine, except one. The remaining four patients had no peptic ulcer, and in all these, except one, a fair correlation was observed between the results of the fractional test meal and the urinary quinine estimation. Thus on the whole, in 8 of the 10 patients, the results obtained with tubeless gastric analysis tallied with those of a fractional test meal. To obtain reliable results, the patients were not given any quinine preparations for a week nor any drugs containing aluminum, barium, calcium, magnesium, kaolin, iron, or vitamins for two days prior to the test. The method is useful in detecting hyperacidity and achlorhydria, but it cannot measure the total and the free hydrochloric acid amounts in the stomach.

NEW ZEALAND

Endocrine Carcinogenesis.—Bielschowsky and Horning (*Brit. M. Bull.* 14:106, 1958) reported that in the last decade views on the role of hormones in carcinogenesis have been greatly modified. New hormones have been recognized and isolated and the metabolic transformations of many steroids clarified. Knowledge of the mechanisms regulating the secretion of these agents has been widened with the result that the pituitary is now considered by many to be the servant of the hypothalamus. Chemical carcinogenesis in the liver depends on pituitary and/or adrenal hormones. Hypophysectomy prevents induction of hepatomas by 3′-methyl-4-dimethylaminoazobenzene and by diacetyl aminofluorene which, however, retains its carcinogenic activity for other tissues. The liver of the hypophysectomized rat still binds the azo dye, but signs of liver damage are missing. The usual reaction to it is restored by giving either ACTH or growth hormone. From the point of view of endocrine carcinogenesis, two different types of cancer occur in animals and men. In hormone-dependent tumors the growth of the neoplasm can be temporarily controlled by an alteration of the hormonal environment in which they develop. Dependent growths are often composed of cells that have been stimulated to proliferate because of a hormonal imbalance, but in some instances they can be induced by extrinsic agents such as irradiation, carcinogenic hydrocarbons, or hormones in combination with irradiation.

Hormone-independent or autonomous lesions, such as those which develop in the skin, stomach, and lung, are not under direct endocrine control, nor can their growth or behavior be influenced by any form of endocrine modification. It is conceivable that some malignant growths might be composed of both dependent and autonomous components. This might explain why a hormone-dependent tumor, whose growth had been previously held in check by means of endocrine therapy, will suddenly lose its responsiveness to a particular hormone or combination of hormones and become an uncontrolled autonomous neoplasm. There appears to be little doubt that the techniques so far used for inducing ovarian tumors in rats and mice are caused by an endocrine imbalance that finally results in tumor formation.

It is, however, more difficult to relate the hormonal theory of ovarian tumor induction to those lesions produced by treatment with carcinogenic hydrocarbons alone. A possible explanation might be that the carcinogens produce a state of anestrus which would probably cause an increase of pituitary gonadotropins, which in turn would stimulate the ovary. Experimenters and clinicians agree that sex hormones of gonadal and adrenal origin play an important part in the development of tumors of the breast, but the role of pituitary factors is less well understood. Knowledge gained by animal experiment has been of direct value in the application of therapeutic measures for the control of hormonal cancer in man. Recurrences of tumor growth after periods of remission after both gonadectomy and adrenalectomy suggest that the anterior pituitary may be capable of stimulating the neoplasms, or it may be that the recurrence of some mammary carcinomas is due to a pituitary hormone or hormones acting in addition to estrogen. The fact that some forms of endocrine cancer can be fully or partly controlled by alterations of the hormonal environment is, to say the least, encouraging.

PORTUGAL

Neurosis and Internal Medicine.—The Portuguese Society of Internal Medicine invited a group of psychiatrists and psychotherapists to define the role played by the psychiatrist, psychotherapist, and internist in the treatment of neuroses. The number of patients with obsessive, conversion, and anxiety neuroses, with repercussion in internal medicine, is so great that it would be impossible to provide specialized psychotherapy for all of them. For this reason it was proposed to indoctrinate the internists in the relatively simple technique of psychotherapy. The suspected neurotic should be sent to the specialist who would establish his diagnosis and indicate the treatment to be used by the internist. In patients with obsessive neurosis, severe hysteria, and anxiety neuroses of long duration the treatment should be left to a psychotherapist. Most neurotics, however, suffer from a superficial reaction which is accessible to a brief psychotherapy. This should be conducted by the internist, after first being outlined by the psychotherapist.

SWEDEN

Cancer of the Penis.—Ekström and Edsmyr (*Nordisk medicin* [June 26] 1958) made a follow-up study of 229 patients with cancer of the penis. In 156 there were no metastases on admission. Patients under the age of 40 had a metastasis rate of 6:10; between the ages of 40 and 70 it was 3:10; and after 70 it was 2:10. The penis was amputated in 194, and local excision was performed on 20. In 15 x-ray treatment alone was given after an exploratory excision. Inguinal evacuation was performed on 105. In 124 of those with no clinical evidence of metastases of the inguinal nodes, fractional treatment was given with teleradium. Of the 194 with an observation period of at least five years, 17 had died of some intercurrent disease, and 112 had originally been free of metastases. Of these, 101 were still without metastases. Of the 177 survivors, 122 were still without metastases. When a small tumor is limited to the prepuce, it would seem that a local excision assures as good a prognosis as amputation of the penis.

Treatment of Psychiatric Patients with Carbutamide.—Dr. Ewert Ljungberg tells in *Svenska läkartidningen* for June 6 how he discovered the treatment of mental ailments with carbutamide when he gave it to his nonogenarian father who was in need of an oral substitute for insulin to combat his glycosuria. While taking a tablet once a day, the father ceased to be troubled by a sense of loneliness and anxiety and by disturbed sleep. This relief from the depression of old age led Ljungberg to give the drug to 19 mildly disturbed geriatric patients. In 11 the beneficial response was prompt and continuous. No effect was observed in three, and in five it lasted only about a month. This effect was regained when the drug was supplemented by treatment with reserpine. Carbutamide was also given to 20 patients suffering from chronic hebephrenic schizophrenia with remarkable improvement in every case. In some respects, but not all, the reaction to the drug corresponded to the reaction expected from insulin shock.

Pyodermia in Runners.—In the past year 12 cross-country runners with pyodermia were treated in a skin hospital in Gothenburg. Of these, five had to be admitted. This circumstance led to the issue of a questionnaire to the participants in the Swedish cross-country event in 1956 in Gothenburg. Replies came from 52 runners who had suffered from the complaint. Widespread though it seems to be, it has not been described in medical literature. Björnberg and Krook (*Nordisk medicin* [June 12] 1958) pointed out that the onset was usually acute, with multiple cutaneous lesions consisting of folliculitis, pustules, and bullae a few days after running. Boils sometimes developed later. Cultures yielded Staphylococcus pyogenes var. aureus in five patients, the same staphylococci with beta-hemolytic streptococci in one, and beta-hemolytic streptococci alone in two. The superficial lesions healed rapidly with local applications of an antibacterial ointment. This disease is so widespread in Sweden that about 260 of 950 cross-country runners questioned said that they had suffered from it. It is confined to the autumn, coinciding in this respect with the peak of morbidity of impetigo contagiosa. Washing the legs in a disinfectant solution before and after running may help to prevent it. The possibility of infection of one runner by another must be kept in mind.

UNITED KINGDOM

Smoking Genotypes.—Sir Ronald Fisher (*Nature* 182:108, 1958) has always contended that there need not be any direct causal effect between cigarette smoking and cancer of the lung but that both characteristics might be largely influenced by a common cause—the individual genotype. His thesis has been that it was within the capacity of human genetics to examine whether the smoking classes to which human beings assign themselves, such as nonsmokers, cigarettes smokers, pipe smokers, and cigar smokers were genotypically differentiated to a demonstrable extent, or whether, on the contrary, they appeared to be genotypically homogeneous, for only on the latter view could causation, either of the disease by the influence of the products of combustion or of the smoking habit by the subconscious irritation of the postulated precancerous conditions be confidently inferred from the association observed. He recorded the findings of Professor F. von Verschuer, of the Institute of Human Genetics of the University of Munster, in an inquiry into the smoking habits of 51 monozygotic and 31 dizygotic male pairs of adult twins. Of the former, 33 pairs were wholly alike qualitatively: 9 pairs both nonsmokers, 22 pairs both cigarette smokers, and 2 pairs both cigar smokers. Twelve pairs, less than 25% of the whole, showed distinct differences, such as a cigarette smoker and a nonsmoker, or a cigar smoker and a cigarette smoker. By contrast, of the dizygotic pairs, only 11 could be classed as wholly alike. Sir Ronald concluded that there could be little doubt that the genotype influenced smoking habits. The genotypically different groups in this regard would be expected to differ in cancer incidence, and their existence helps to explain such oddities as that pipe and cigar smokers should show much less lung cancer than cigarette smokers, while among the latter the practice of inhaling is associated with less rather than with more cancer of the lung.

Chemotherapy in Pulmonary Tuberculosis of Doubtful Activity.—In view of the many patients under observation whose only manifestation of tuberculosis is an abnormality discovered on mass miniature radiography, in 1954 the Research Committee of the Tuberculosis Society of Scotland decided to investigate whether it was worth while treating such patients prophylactically. The committee reported (*Tubercle* 39:129, 1958) on their findings in a trial which included 189 such patients who were divided at random into two groups: a control group, consisting of 94 patients, kept under observation in the usual way, and a test group, consisting of 95 patients, similarly observed but in addition given a minimum of six months' prophylactic chemotherapy. All the patients were in the trial for at least a year, 61% for 18 months, and 29% for two years. Those in both groups continued to lead a normal working life. Those in the test group were also given 5 Gm. of sodium PAS plus 100 mg. of isoniazid, both twice daily. These were combined in cachet form and were prescribed for a minimum of six months, and thereafter at the clinician's discretion.

Radiographically the estimated cumulative deterioration was 12.6% in the control group compared with 8.1% in the treated group, but six of the seven patients showing deterioration in the treated group admitted that they had failed to take their drugs as directed. Nine positive cultures occurred in the observation group, compared with one in the treated group. The latter was in a patient who had failed to take her chemotherapy as directed. Total deteriorations, radiographic and bacteriological, were 17.8% in the observation group and 8.5% in the treated group. Most improvement or deterioration occurred in the first 18 months of observation. It was concluded that it may be worth while to give chemotherapy prophylactically to certain patients who are at greater risk of relapse, in particular, younger patients and those with more extensive disease. Every effort must be made to persuade such patients of the importance of taking his drugs, and it is well to check the urine periodically for the presence of PAS. Untreated patients should be regularly observed, radiographically and bacteriologically, and should be treated if there is any sign of deterioration. Although this sort of trial may assist the physician in making sound decisions, the patient remains an individual with social, medical, and personal problems. In deciding whether to advise chemotherapy all these must be taken into account.

Smoking and Cancer.—According to the annual report of the Tobacco Manufacturers' Standing Committee—a committee set up by the major firms in the British tobacco industry to assist research into questions concerning the relationship between smoking and health—experiments have been carried out in the industry's laboratories to discover substances which might be used to reduce the minute quantities of benzpyrene in cigarette smoke. A large number of compounds of different types have been examined and so far two substances—copper nitrate and platinum diamino-nitrite—have been found, either of which reduces the benzpyrene content of cigarette smoke. The claim that the addition of 4% ammonium sulfamate to the paper could have a similar reducing effect was not substantiated, although it was shown that the addition of relatively large quantities of ammonium sulfamate to the tobacco does reduce the benzyprene content of the smoke. These findings are based entirely on laboratory experiments. If it were shown that the use of such substances were desirable, investigation of their side-effects would have to be made.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Acute Myocardial Infarction in a City Hospital: I. Clinical Review of 264 Cases. M. Malach and B. A. Rosenberg. Am. J. Cardiol. 1:682-693 (June) 1958 [New York].

The authors report on 162 men (61%) and 102 women (39%), between the ages of 32 and 97 years, with myocardial infarction who were admitted to the Kings County Hospital in Brooklyn, N. Y., between July 1, 1954, and June 30, 1955. One hundred eighty-four patients were between the ages of 61 and 85 years, representing a greater number of older patients in this group than in previous reports. One hundred eight (63%) of the 264 patients were Jews and only 3 were Negroes. Sixty-nine patients had a familial history of heart disease, 61 had evidence of a previous myocardial infarct, and 69 had a history of previous diabetes. Thus, previously reported findings of a greater incidence of myocardial infarction in men, Jews, and patients with a familial history of cardiovascular disease, previous evidence of coronary artery disease, or diabetes mellitus were supported. A very low incidence of acute myocardial infarction in Negroes was observed. Painless cardiac infarction was noted in 55 patients (21%). Of 115 patients with normal blood pressure, 61 died, a mortality rate of 53% as compared with 37 (32%) of 114 patients who had hypertension (blood pressure above 150/90 mm. Hg) on admission or at some time during the hospital course. The latter patients thus showed a greater survival rate than those with normal blood pressure or hypotension. The grave prognosis of shock associated with myocardial infarction was confirmed.

Laboratory studies revealed that 70 patients (29.1%) had a hemoglobin level of more than 15 Gm. per 100 cc. on admission, but this elevation was transient. Cardiac rupture occurred in 3 patients who did not receive anticoagulants but were given ascorbic acid. This observation was paradoxical, since the greater survival rate among those patients who were given vitamin C was statistically significant. One hundred twenty-four (47%) of the patients died; 56 died within the first 48 hours of hospitalization, and 68 died more than 48 hours after admission. This high mortality rate was attributed to the age of the patients, the large number of more critically ill patients, lack of private nursing care, a high incidence of congestive failure, prolonged fever, and tachycardia.

Acute Myocardial Infarction in a City Hospital: II. Experience with Anticoagulants. B. A. Rosenberg and M. Malach. Am. J. Cardiol. 2:71-80 (July) 1958 [New York].

There are 3 points of view with regard to the use of anticoagulants in acute myocardial infarction: (1) they should be used routinely; (2) they should be used selectively; and (3) they should not be used at all. Experience with anticoagulants in acute myocardial infarction reported from large municipal hospitals differs somewhat from that of voluntary institutions. This report deals with the use of anticoagulants in patients with acute myocardial infarction discharged from the University medical service (division 2) of Kings County Hospital, Brooklyn, between July 1, 1954, and June 30, 1955, inclusive. Of a total of 264 such patients, 66 received anticoagulants, while 198 did not receive these drugs. Anticoagulants did not improve the survival rate in this series. There was but 1 major hemorrhagic complication, i. e., hemopericardium without myocardial rupture, related to the use of these drugs, and this complication did not contribute to the death of the patient. The authors observed cardiac rupture in 3 patients who did not receive anticoagulants. The incidence of minor hemorrhagic complications, such as hematuria, in the treated group was of the same order as that previously reported by others.

Serum Glutamic Oxalacetic Aminopherase (Transaminase) Text in Myocardial Infarction: Determination with the Calorimetric Method. D. Ciocia and G. Nodari. Gior. clin. med. 39:621-650 (April) 1958 (In Italian) [Bologna, Italy].

Serum glutamic oxalacetic aminopherase (tranaminase) test by the calorimetric method of Frankel-Reitman was performed on 22 patients with cardiac disease. Unequivocal evidence of myocardial infarction was present in 6 patients, equivocal myocardial infarction in 10, and angina

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The place of publication of the periodicals appears in brackets preceding each abstract.

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pectoris not related to myocardial infarction in 16. High serum aminopherase level was observed in patients who had unequivocal, as well as in those patients with equivocal, evidence of myocardial infarction, in whom myocardial infarction was subsequently confirmed by other procedures. Serum aminopherase level did not change in patients with angina pectoris which was not associated with a myocardial infarction.

The specific usefulness of the determination of serum aminopherase level consists in its precocity in establishing the presence or the absence of a myocardial infarction. Elevation of serum aminopherase level was already evident at 4 to 6 hours, and it reached the maximum values 14 to 36 hours after the infarction episode took place. The values decreased afterward and fell to normal levels in 4 or 5 days. Change in leukocytosis, speed of erythrocyte sedimentation, fall of arterial pressure, onset of fever, and electrocardiographic signs of myocardial lesion are factors which complete the diagnosis of myocardial infarction, but only after the change in serum aminopherase level had taken place. Serum glutamic oxalacetic aminopherase test in myocardial infarction is of a lesser prognostic value than other clinical procedures.

Aortic Thrombosis. F. Starer and D. Sutton. Brit. M. J. 1:1255-1263 (May 31) 1958 [London].

The authors report on 24 men and 8 women, between the ages of 37 and 78 years, with aortic thrombosis (Leriche's syndrome) who were admitted to St. Mary's Hospital in London during a 4-year period. Intermittent claudication was present in nearly all the 32 patients and was the outstanding symptom. Loss of power in the legs, frequently accompanied by muscle wasting, appeared to be the symptom next in frequency and occurred in about half of the patients. Four men admitted to impotence (failure to maintain an erection caused by failure of adequate blood supply to the corpora cavernosa through the internal pudendal artery), but it may be presumed that the true incidence of impotence was actually higher. Six patients had mitral stenosis and auricular fibrillation; the aortic thrombosis in these patients was apparently a result of more distal emboli causing retrograde clotting into the aorta. The aortic thrombosis in 3 patients may have been related to trauma. In the other 23 patients the aortic thrombosis resulted from atheroma affecting the common iliac arteries and the lower abdominal aorta. Buerger's disease and other forms of "aortitis," which have been cited as responsible by other workers, are considered to be of little importance. The diastolic pressure was below 90 mm. Hg in 18 patients, from 90 to 100 mm. Hg in 8, from 100 to 110 mm. in 4, and above 120 mm. in 2; these findings show that hypertension is not particularly associated with aortic stenosis, but, since an increased blood pressure predisposes to atheroma, it may become one causative factor in aortic thrombosis. Of 5 patients in whom renal arterial stenosis was observed, 2 had normal blood pressure, 1 had mild hypertension, 1 had a blood pressure of 180/110 mm. Hg, and 1 had a blood pressure of 220/120 mm. Hg. In 1 of these patients an erroneous diagnosis of pheochromocytoma was made.

Plain roentgenograms are of little importance in the diagnosis of aortic thrombosis. Aortography is the most useful procedure in making a positive diagnosis, and it was used in all the patients. The 2 constant features, which between them established the diagnosis, were an abruptly ending column of contrast medium, the block lying anywhere between the level of the renal arteries and the aortic bifurcation, and the presence of a collateral circulation. About half of the patients had occlusion well below the level of the renal arteries, and the others had it directly below this level. In 5 patients the aortic thrombus appeared to be extending into one or the other renal artery. In most of the patients the common iliac arteries were occluded, and flow could be seen to start about the iliac bifurcation. In 1 patient thrombosis extended to the commencement of the femoral artery. The diagnosis of aortic thrombosis should be readily suspected on clinical grounds, but differentiation from bilateral iliac thrombosis is not possible without aortography. Complications of aortography were not observed in this series of patients, and the hazards of aortography recorded by other workers are considered to have been mainly due to faulty techniques. It is concluded that aortic thrombosis is neither as rare nor, in most cases, as dangerous to life as was previously thought.

Signs and Symptoms in Chronic Renal Failure: II. Vomiting, Twitching, Haemorrhagic Diathesis, Convulsions, Itching, and Diarrhoea. P. Effersøe. Acta. med. scandinav. 160:417-430 (No. 5) 1958 (In English) [Stockholm].

In the first of 2 papers an account was given of the relationship between the renal function and the degrees of anemia and acidosis in chronic renal disease. The present study, based on the same 41 patients, is concerned with an analysis of some of the other signs and symptoms that may occur in chronic renal disease. Vomiting, twitching, hemorrhagic diathesis, convulsions, itching, and diarrhea were investigated. It was found that the incidence of vomiting, twitching, and hemorrhagic diathesis rises with increasing impairment of the renal function. Convulsions in nearly all cases are almost certainly of either tetanic or hypertensive origin. Occurrence of "uremic convulsions," independently of these 2 factors, is questionable. Diarrhea is often caused by laxatives in ordinary doses, patients with impaired renal function being sensitive to laxatives. Edema contributes to the development of diarrhea.

Itching subsided in some of the patients, even though the renal function did not improve. The reason for this may be discontinuation of treatment with an itch-provoking drug prior to admission, and partly reduction during the stay in hospital of the amount of urea on the skin. This reduction may be due to improved hygiene in hospital or, perhaps, to a fall in the serum urea concentration on account of a lower protein content in the diet or to rehydration, the concentration of urea in sweat being proportional to that in plasma.

It was observed also that the incidence of vomiting and twitching is independent of the diet, whether it is normal or low in protein, unless bicarbonate is given. Administration of bicarbonate will probably raise the incidence of vomiting on a low-protein diet and the incidence of twitching on either diet. Hypertension has no demonstrable influence on the incidence of vomiting, twitching, or hemorrhagic diathesis, but it has great influence on the occurrence of convulsions. Vomiting, twitching, convulsions, and itching may occur when the renal function is about 10% of normal, whereas hemorrhages and diarrhea (without attendant edema) usually do not occur till the renal function has been impaired to under about 5%. Acidosis, vomiting, twitching, itching, convulsions, hemorrhagic diathesis, and diarrhea do not occur in patients with chronic uremia, if the hemoglobin level is above 75%.

Hyperchloremic Acidosis in Chronic Pyelonephritis. W. Lathem. New England J. Med. 258:1031-1036 (May 22) 1958 [Boston].

Hyperchloremic acidosis is a characteristic feature of a variety of kidney diseases that have in common impairment of urinary acidification with the excretion of an alkaline urine. These disorders, which include renal tubular acidosis and the Fanconi syndrome, are characterized principally by minimal alterations in glomerular filtration rate, at least in early stages, and by disturbances in renal tubular function that affect not only urinary acidification but also the tubular transport of glucose, phosphate, urate, amino acids, and potassium. The loss of alkali in the urine or, alternatively, the impairment of hydrogen ion secretion by the renal tubules clearly accounts for the metabolic acidosis common to these disorders, but the origin of the associated hyperchloremia has been confusing. It has been suggested that hyperchloremia may develop as serum bicarbonate diminishes in the interests of maintaining isotonicity and electroneutrality of extracellular fluid when the concentration of other ("undetermined") anions does not change. According to this concept, the ultimate concentration of chloride in extracellular fluid in renal acidosis will be conditioned by the concentration of other anions. Thus, in uremia, in which acidosis is attributable to impairment of tubular secretion of hydrogen ions, the serum chloride concentration may remain constant as serum bicarbonate diminishes, owing to impairment of filtration and retention of undetermined anions. Under circumstances in which glomerular function and tubular function are more or less equally impaired, the concentrations of bicarbonate and undetermined anions in extracellular fluid may change in a reciprocal manner, the chloride concentrations remaining unchanged.

Hyperchloremic acidosis is therefore not unique to the "renal tubular" syndromes but might appear in any renal disease under circumstances in which impairment of tubular function and hydrogen ion secretion are disproportionately greater than changes in glomerular function. The author presents the histories of 4 patients with hyperchloremic acidosis, in whom chronic pyelonephritis was associated with the excretion of an acid urine; hyperkalemia was a prominent feature. These changes appeared before or coincident with the development of azotemia and were attributed to disturbances in renal tubular function. Acidosis and hyperkalemia persisted as uremia developed, but as the concentration of undetermined anions increased in extracellular fluid, hyperchloremia tended to diminish. The acid urine and hyperkalemia and the absence of nephrocalcinosis, hypophosphatemia, and osteomalacia were characteristic features that served to distinguish between the hyperchloremic acidosis of chronic pyelonephritis and that of "renal tubular acidosis."

Multiple Myeloma: Clinical Investigation of Proteinic, Hematological and Renal Changes: 1. Proteinic Changes. V. Prato and P. Chiesura. Minerva med. 49:1562-1572 (April 25) 1958 (In Italian) [Turin, Italy].

Serum and urine specimens of 14 patients with multiple myeloma were tested for the presence of protein by electrophoresis. Paper electrophoresis revealed abnormal serum protein pattern in 12 patients (85.7%) and normal serum protein pattern in 2. Abnormal beta serum component was observed in 3 patients, abnormal gamma component in 8, and abnormal "M" component in 1. Electrophoretic analysis of the urine showed an abnormal protein pattern in 9 patients (65%). The Bence Jones protein test ordinarily shows an abnormal urine protein pattern in less than one-half of the patients with multiple myeloma. Electrophoretic analysis has thus proved to be a more accurate method than the Bence Jones protein test for determining an abnormal urine protein pattern in patients with multiple myeloma. In the opinion of the authors there is no direct correlation between the serum and the urine protein components in these patients. The combination of the preceding 2 electrophoretic tests, one for serum and the other for the urine protein components, is a very accurate procedure for the diagnosis of multiple myeloma and may be depended on in almost 100% of instances.

Multiple Myeloma: Clinical Investigation of Proteinic, Hematological and Renal Changes: 2. Hemato-Medullary Changes. V. Prato and P. Chiesura. Minerva med. 49:1572-1580 (April 25) 1958 (In Italian) [Turin, Italy].

Diagnostic values of the peripheral blood and of myeloma cells in the bone marrow were studied in 15 patients with multiple myeloma. Observation of the peripheral blood revealed only a nonspecific decrease of the bone marrow function. Study of the bone marrow in these patients has proved to be a conclusive diagnostic procedure. Myeloma cells of bone marrow, obtained mostly by sternal puncture, were larger in size than normal plasma cells. The largest observed diameter in cells with 1 nucleus was 28 μ. Cells with nuclei of recent formation, with nucleoli and with slightly basophil protoplasm, were found in all patients. Paraploid was a significant diagnostic feature of the disease; cells with 3 or 4 nuclei were found in all but 1 patient. All the patients had anemia, which was normochromic or slightly hyperchromic, and normocytic or slightly macrocytic. A moderate leukocytosis, which was present in the first stage of the disease, developed into leukopenia. Immature cells, mostly of the granulopoietic group, were found in the circulation of 6 patients (40%). Hemorrhage was observed in 5 patients (33%); it was mostly related to the reduction in the number of platelets and to marked capillary fragility. The latter disorder was observed in 7 other patients.

Bleeding Duodenal Ulcer: Treatment with Bio-Flavonoids and Diet: Report on 36 Cases. S. Weiss, J. Weiss and B. Weiss. Am. J. Gastroenterol. 29: 629-642 (June) 1958 [New York].

The authors report on 36 patients with hemorrhagic duodenal ulcer who were treated during the years 1952-1956 with the permeability factors known as water-soluble citrus bioflavonoids, which control capillary functioning and arrest capillary hemorrhage. In all cases of bleeding duodenal ulcer the bioflavonoid compound was administered orally, 3 to 9 capsules a day in conjunction with an orange-juice-milk-gelatin mixture and Weiss's modified Meulengracht diet. Twenty-two patients had uncomplicated duodenal ulcer, 4 patients had duodenal ulcer with massive bleeding, 3 patients had perforated duodenal ulcer with severe hemorrhage, and 7 patients had duodenal ulcer with gastric erosions accompanied by massive hemorrhage. All the patients responded to the combined treatment with bioflavonoids, diet, and medication. Bleeding was arrested, and the stool was free of blood in from 6 to 8 days, except in 2 cases where traces of blood in the stool were present for 10 and 13 days respectively. The return of the mucous membrane and the duodenal contour to normal took 10 to 20 days according to roentgenographic examinations. The authors' clinical findings suggest that for most cases of peptic ulcer a medical approach, with emphasis on diet and restoration of integrity of the capillary vessels of the mucosa, should be attempted first. In most cases of duodenal ulcer surgery might be avoided in favor of rational medical approach to this disease.

Neuropsychiatric Symptoms in Liver Insufficiency. B. Harvald and M. Bjørneboe. Acta med. scandinav. 160:373-384 (No. 5) 1958 (In English) [Stockholm].

Liver insufficiency is the final stage of a number of different diseases of the liver. It may also be observed as a transient or recurring episode. The cause of liver insufficiency is most frequently viral hepatitis or cirrhosis of the liver, but toxic liver diseases, eclampsia, and various forms of occlusion of the biliary tract may also lead to liver insufficiency. The clinical picture is characterized by intense icterus in the great majority of cases, pyrexia, ascites and edema, fetor hepaticus, and various neuropsychiatric symptoms. The authors present observations on the neuropsychiatric symptoms of liver insufficiency in 19 patients who were admitted to the medical department of Blegdamshospitalet during the period from January, 1956, to March, 1957. The patients in this series were carefully followed up with regard to the development of neurological and psychic phenomena; electroencephalograms were recorded in all patients on 1 or more occasions. The material comprises 4 patients with alcoholic cirrhosis, 9 with probable chronic hepatitis, 4 with subacute hepatitis in whom acute hepatitis had developed directly into liver insufficiency, and, finally, 2 with chronic hepatitis in whom portacaval anastomosis had been performed on account of increased pressure in the portal area and subsequent formation of varices and ascites. The majority of the patients were over 60 years old; only the patients in the group with subacute hepatitis and 1 of the patients with portacaval anastomosis were younger.

The neurological symptoms may be divided into 2 groups, mental changes and abnormal motor activity. The mental changes begin insidiously. The patients become lethargic or excited; they become confused and disorientated in time, place, and personal data; the memory is poor, and simple arithmetical calculations cannot be accomplished. The patients urinate and defecate at unsuitable times and places. This stage is followed by somnolence, gradually merging into unconsciousness. The development of these mental changes is more acute in hepatitis and slower in cirrhosis. The mental symptoms may be so pronounced that the patient is hospitalized as for psychiatric treatment. The triad consisting of psychic changes, the singular spasmodic movements known as "flapping," and an abnormal electroencephalogram occurs with great frequency. Six of the 19 patients died during the period of observation. Hepatic coma is not a hopeless condition but is, particularly in chronic liver diseases, to a certain extent amenable to therapy and prophylaxis.

SURGERY

Mesenteric Vascular Thrombosis. R. W. Robertson and W. B. Haley. J. Kentucky M. A. 56:568-571 (June) 1958 [Louisville].

Seven patients with mesenteric vascular thrombosis, ranging in age from 30 to 78 years, were operated on; 6 survived surgery, the 1 fatality being a 78-year-old cardiovascular patient in whom resection was impossible. Five of the 6 survivors contacted recently report that they are in good health and are leading normal productive lives. Although the prognosis is a function of the amount of intestine involved, the age of the patient, the associated conditions, the time lag between onset and surgery, and the preoperative and postoperative care, the decrease in mortality in recent years is due to the strict regulation of electrolyte balance, freer use of blood, and the much improved postoperative care. Supportive therapy in the disease entity, described as recently as 1942 as universally fatal, is particularly important, requiring constant and diligent attention to the patient who has endured resection of sufficient magnitude to be comparable to a severe internal hemorrhage.

Anemia After Subtotal Gastrectomy. J. Van Geertruyden. Acta clin. belg. 12:171-201 (March-April) 1958 (In French) [Brussels].

In a series of 659 patients followed up from 1 to 10 years after a subtotal gastrectomy for ulcer, cancer, tumor of connective tissue, or polyp, anemia appeared in 17% of the patients. The mean hemoglobin values were 14.1 Gm. per 100 cc. for men and 12.5 Gm. per 100 cc. for women, or about 2 Gm. lower than the values observed in a normal population. Anemia was hypochromic in 15% of the patients and megaloblastic in 2%. Hypochromic anemia is due to several factors: 1. The role of gastric achlorhydria is of little importance. One hundred thirty-five achlorhydric patients had a mean hemoglobin value of 13.1 Gm. per 100 cc.; 23% were anemic. Seventy-four chlorhydric patients had a mean hemoglobin value of 13.7 Gm. per 100 cc.; 14% were anemic. 2. A postoperative protein deficiency reduces simultaneously the hemoglobin and serum albumin levels. In 122 patients studied, a positive correlation was observed between hemoglobin and serum protein and albumin values. 3. With regard to the preoperative hemoglobin level, it was found that patients predisposed to anemia before gastric resection show the same tendency after the operation. 4. Study of the postoperative hemoglobin level showed that anemia is much more frequent in patients in whom this level is low. After subtotal gastrectomy the first 3 factors interfere with the normal hemoglobin synthesis. It is therefore important that all blood deficiencies occurring before and during surgery be perfectly corrected.

The few cases (14) of megaloblastic anemia encountered in patients in the series who had undergone partial gastrectomy were not a consequence of the gastric resection. Most of them were seen in patients operated on for cancer (6 patients or 4.1%) or polyp (7 patients or 35.0%); in these patients the disease was already present before the gastrectomy. One very rare case of megaloblastic anemia (1 patient or 0.2%) appeared after resection for peptic ulcer. Since this (0.2%) frequency is identical with the percentage observed in a normal population, it must be concluded that its appearance is a pure coincidence.

Retrograde Surgical Drainage of Pancreas for Chronic Relapsing Pancreatitis. C. B. Puestow and W. J. Gillesby. A. M. A. Arch. Surg. 76:898-907 (June) 1958 [Chicago].

In primary pancreatitis, as found in the chronic alcoholic patient, the disease is in the pancreas proper, and operations on the biliary tract or on the head of the pancreas are unlikely to afford relief. There are 5 basic principles which must be understood in arriving at the proper management of this disease entity: 1. The pain of chronic relapsing pancreatitis is due to increased intraductal pressure resulting from partial duct obstruction. 2. Calcification in the pancreas is due to calcium-soap formation in the pancreatic substance, not calcium formation in the duct. 3. The obstruction in the pancreatic duct may be in several places; there is an alternate dilation and stenosis, "chain-of-lakes" appearance, of the duct. 4. Catarrhal inflammation of the duct system occurs wherever strictures are present and prevents free communication of fluid from one dilated area to another. 5. With adequate drainage of the pancreas there is pancreatic regeneration of some degree, and even a severely "burned-out" pancreas may partially recover.

The pain of chronic relapsing pancreatitis will be relieved if and when the ductal system is adequately decompressed, and not, as previously stated, upon termination of perineural inflammation. Calcification occurs in the substance of the pancreas and is not limited to the pancreatic duct. If the necrosis of the pancreas is adjacent to the duct, the calcification will occur at this site and may involve the duct; however, pancreatic calcifications are not calculi in the sense in which gallbladder and renal calculi are so considered. The contention that the pancreas has the powers of regeneration is valid, and the pancreas is further credited with the ability to recover even when fibrosed or "burned out."

In 1911 Link reported the establishment of an external pancreatic fistula by mobilizing the tail of the pancreas and bringing it to the anterior abdominal wall. Hunt is reported as using retrograde pancreaticojejunostomy in his resections for pancreatic carcinoma. An analysis of the results of the 21 cases in which the modified caudal pancreaticojejunostomy has been carried out by various methods reveals no operative mortality. Two patients died later, and 2 others had recurrence of pain. To the last 4 cases in which the procedure was considered adequate—complete opening and exposure of the pancreatic duct and pancreaticojejunostomy, either by the sheath method or by the side-to-side method—the results have been excellent. The recovery time of this procedure, so far as pain is concerned, is almost immediate. In either method of pancreaticojejunostomy, a Roux-Y reconstruction of the gastrointestinal tract is performed. Pancreaticogastrostomy has been performed on 2 patients. A decision as to whether this procedure is worthwhile is being withheld at this time pending evaluation of clinical material.

Primary Adenocarcinoma of the Ampulla of Vater. W. de Graffenried Hayden and N. C. Hightower Jr. South. M. J. 51:730-738 (June) 1958 [Birmingham, Ala.].

Eighteen cases of adenocarcinoma of the ampulla of Vater were observed at the Scott and White Clinic, Temple, Texas, during the period from 1924 to 1956. Two cases were excluded from this study because of insufficient pathological material for microscopic proof of diagnosis. Of the remaining number, 12 were proved by biopsy at the time of operation, and 4 were proved by postmortem examination. The ratio of males to females was 13 to 3. The 16 cases bring the total of reported cases of primary adenocarcinoma of the ampulla of Vater to more than 400. The authors conclude that (1) primary carcinoma of the ampulla of Vater is not a rare condition; (2) it is characteristically a small, slow-growing, late-metastasizing growth, amenable to surgical treatment; and (3) it should merit some consideration in the differential diagnosis of persistent pain of a vague nature in the upper abdomen. Any one, or a combination, of the signs and symptoms coincident with an obstructive type of jaundice may represent the earliest evidence of ampullary carcinoma. In the prejaundice stage, laboratory data are of little diagnostic aid other than for the suggestive nature of finding occult blood in the stool.

If there is evidence at the time of operation that the biliary tree is distended behind an obstruction, careful palpation of the duodenum and thorough exploration of the common bile duct may be done without any proof of diagnosis. The passage of instruments through the ampulla of Vater is important. In 4 patients (in 5, counting the 1 noted at postmortem examination), the ampullary region could be palpated, and the common duct was explored well, but there was no suggestion of a malignant lesion at the ampulla of Vater; the duodenum had to be opened to establish the diagnosis. In 1 patient, even opening the duodenum did not establish the diagnosis until biopsy was performed and the tumor was proved by microscopic examination. Thus, in 9 of the 15 patients tested, probes would pass the growth at the ampulla; in 4, there was some evidence of increased resistance which suggested obstruction. When a malignant lesion of the pancreas can be excluded, it becomes mandatory to open the duodenum, carefully inspect the ampulla of Vater for a growth, and perform a biopsy on the ampulla if no gross evidence of a tumor is found. The coincidence of choledocholithiasis and carcinoma of the ampulla is a most treacherous situation as the calculi represent one source of obstruction. Such a situation may be further complicated by the fact that "long-armed" T-tubes may be passed through the ampulla and further mask the presence of a malignant lesion for several weeks. Against such a possibility, transduodenal exploration of the common bile duct is recommended in patients with choledocholithiasis. There seems to be little disagreement that radical surgical procedures are indicated when the patient is able to withstand a wide resection. This study indicates that, if radical surgical procedures are not performed, some type of "bypass" operation would be preferable to local excision of the cancer.

Perforating Peptic Ulcer in Infants. C. M. Grasveld. Arch. chir. neerl. 10:81-87 (No. 1) 1958 (In English) [Arnhem, Netherlands].

A 10-month-old boy was hospitalized because of a violent convulsion, with increase in temperature. His mother and sister had had abdominal influenza in the course of the same week. Questioning revealed that there had often been black stools in the past. Two days after the admission, hematemesis began. The child was pale and moaned. The abdomen was distended and tender and showed muscular defense. An intravenous infusion was given to counteract the shock, and a laparatomy was performed as soon as the condition had slightly improved. The laparotomy liberated free air and large quantities of black fluid. A large perforating ulcer was found in the superoposterior part of the duodenum. The pancreas was sutured partly over the defect. Eighteen months after the operation the child was normal for his age. Appetite and growth were satisfactory, and there was no vomiting. No black stools had been passed. The author cites 2 colleagues who had performed operations for perforating ulcer in infants. The histories of these infants are presented. One was admitted 24 hours after birth, and when the peritoneum was opened, gas escaped. The abdominal cavity contained a considerable quantity of bilious fluid and foam. Exploration revealed free perforation of a fingertip-sized ulcer on the anterior side of the duodenum; this was sutured. This girl was in excellent condition when seen about 5½ years after the operation. The other patient was a 14-month-old boy, in whom a perforating duodenal ulcer was found. A Pólya-Reichel modification of a Billroth 2 gastrectomy was performed. Convalescence was uneventful.

NEUROLOGY & PSYCHIATRY

Psychometabolic Changes in Phenylketonuria Treated with Low-Phenylalanine Diet. H. Meyer, E. T. Mertz, H. E. Stadler and others. A. M. A. Arch. Int. Med. 101:1094-1105 (June) 1958 [Chicago].

The dietary approach to the fully developed state of phenylketonuria is a mandatory step, which while not routinely leading to definite general improvement does lend the patient a sense of well-being and increased motor activity heretofore not accomplished. The 6 children chosen for the experiment (most of whom were blond-haired and blue-eyed with blue sclera) were all severely mentally retarded. Four of the 6 patients had obvious cranial and developmental anomalies; 1 was an active epileptic before the research period began and, with 2 other patients, experienced seizures during the experiment. None of the children were toilet-trained; none could feed or dress himself, though 1 of the children had made some progress in this direction; speech was absent, as was any communication within this group; and all of the patients exhibited many of the chracteristics commonly associated with childhood schizophrenia.

Two problems presented themselves. The first was recognition of the pure phenylketonuric. The second was the problem of irreversibility and at what age the therapeutic effect would be questionable. A general analysis of the data reveals an uneven pattern of development, with some slight improvement in the group receiving the diet and some additional improvement in the control group when they were given the diet. There were no changes in mental development, although there were some very definite changes in the area of functional efficiency. Many of the autistic symptoms either disappeared or were abated in the group given the diet, while there was no noticeable change in this area in the control group. Inasmuch as the phenylketonuric patient is burdened with a number of congenital anomalies which are essentially irreversible, any major change in mentation is unlikely. However, the pattern of social maturation is accelerated, and the patient can be trained to complete developmental tasks.

Epidemiology of Poliomyelitis in Switzerland: I. Statistics on Morbidity and Mortality and on the Immunity Status. M. Schär. Schweiz. med. Wchnschr. 88:515-520 (May 24) 1958 (In German) [Basel, Switzerland].

The author lists in a table statistics on poliomyelitis in Switzerland from 1925 to 1957. Figures on the morbidity (number of cases per 100,000 inhabitants) and on the lethality (number of deaths per 100 cases of sickness) show that the morbidity has been greatly increasing since 1936. whereas the lethality is decreasing. Furthermore, in years when the prevalence of poliomyelitis assumes epidemic proportions the lethality rate is much lower than when the poliomyelitis morbidity is low. A lower lethality rate could be caused by a less virulent organism, by improved therapy of severe forms of the disease, or by the diagnosis and reporting of more atypical and nonparalytic cases of the disease. The author regards the first 2 factors as improbable and believes that in epidemics atypical cases are more often reported than when there is no epidemic. Under such conditions it is impossible to recognize minor epidemic trends of poliomyelitis or to evaluate the effectiveness of an immunization campaign. About 70% of the patients with poliomyelitis were children below 15 years of age. The morbidity was greater in males than in females, with the exception of the age group 20-29.

Commenting on periodic fluctuations in poliomyelitis morbidity, the author says that in densely populated areas epidemics seem to develop every 3 or 4 years, whereas in the less populated ones epidemics seem to occur every 5 to 7 years. Serologic tests performed in several Swiss cantons revealed that a relationship between the incidence of poliomyelitis and the immunity status of the child population exists only within geographically limited areas. Morbidity rates alone do not permit one to draw conclusions about the immunity status of the population. The immunity status of a person depends on his age, on his socioeconomic level, and on the frequency of appearance of poliomyelitis at the place of residence. Boys show higher morbidity than girls but also more frequent inapparent immunization.

Epidemiology of Poliomyelitis in Switzerland: II. The Results of Vaccination During 1956 and 1957. M. Schär. Schweiz. med. Wchnschr. 88:521-524 (May 24) 1958 (In German) [Basel, Switzerland].

It is estimated that 90% of the cases of poliomyelitis were reported during the years 1956-1957 to either the Swiss Federal Office of Public Health or the Sickness Insurance Organization. Virological and serologic studies on patients, in whom nonparalytic poliomyelitis had been diagnosed, disclosed that many of these cases were caused by agents other than poliomyelitis viruses. Between October, 1956, and May, 1957, about 42% of the population under 20 years of age received at least 2 vaccinations against poliomyelitis, but only about 5% received a third injection. In the year 1957 the number of cases of paralytic poliomyelitis was reduced by 500 in comparison with 1956. The decrease in incidence of the disease was most marked in children between 5 and 15 years of age but was very little in adults between 20 and 29 years of age. Among the young patients with nonparalytic poliomyelitis, 26% were immunized twice or 3 times; among those with paralytic cases, however, only 11.2%. It may be concluded that about 70 to 75% of the vaccinated persons were protected against the paralytic form of the disease. In 1957, 30 to 35% of the poliomyelitis cases were caused by the type 2 and 50 to 60% by the type 1 virus. In the preceding years about 90% of the poliomyelitis cases were due to the type 1 virus. The author points out that most batches of Salk vaccine are much more effective against the type 2 than against the type 1 poliomyelitis virus. Therefore, vaccination may prove less effective in an epidemic caused chiefly by the type 1 virus.

First Results of Vaccination Against Poliomyelitis in Basel in 1956-1957. E. Berger and A. Hottinger. Schweiz. med. Wchnschr. 88:524-530 (May 24) 1958 (In German) [Basel, Switzerland].

During the vaccination periods 1956-1957, about 30,000 persons in the city of Basel were vaccinated against poliomyelitis with Salk vaccine. Side-reactions to the vaccine were rare. More than 70% of the children between 2 and 14 years were vaccinated, and among those in the first 6 grades of school between 80 and 99% were vaccinated. The efficacy of vaccination was demonstrated by a general reduction in the incidence of poliomyelitis and particularly by a decrease in the paralytic form in children. The authors feel that the number of cases observed is too small for epidemiologic statistics on the prophylactic values of the Salk vaccine.

It was definitely demonstrated, however, that the vaccination increased the virus neutralizing antibodies in the blood. Either such antibodies appeared in the blood after the vaccinations or, if they had been present before, they were augmented. However, the antibody response was not uniform; in a few persons the antibody content was no higher after than before the series of 3 vaccinations. The degree of inapparent immunization, that is, the basic immunity against poliomyelitis, was investigated before vaccination, and it was found that 15% of the population in Basel had antibodies against the poliomyelitis virus as measured by the complement-fixation reaction. Vaccination with the Salk vaccine led to a definite increase in the basic immunity against the disease. The period of effectiveness of the vaccination can be measured by the determination of the neutralizing antibodies present in the circulating blood. The need for additional vaccinations with Salk vaccine can then be estimated.

Determination of Neutralizing Antibodies Against Poliomyelitis Before and After Vaccination with Salk Vaccine in Infants and Young Children. F. Buser, R. M. Du Pan and A. Mégevand. Schweiz. med. Wchnschr. 88:531-532 (May 24) 1958 (In German) [Basel, Switzerland].

The serums of 28 infants and children were examined for the presence of neutralizing antibodies before and after vaccination with the Salk vaccine. After 2 vaccinations the result was poor. Only in a very few instances could a rise in the level of the neutralizing antibodies be demonstrated. The result after the third vaccination was somewhat better, especially for the antibodies directed against the type 2 poliomyelitis virus. Contrary to the findings of American investigators, optimal levels of the antibodies directed against the type 1 and the type 3 virus could be achieved only in a few instances. This difference is attributed to the new and stricter regulations in the preparation of the vaccine.

Hydrocortisone and Vitamin B_6 in Treatment of Multiple Sclerosis: Preliminary Clinical Note. F. Reyes Oliveros, A. Sixto and M. Garrido Garrido. Med. clín. 30:118-119 (Feb.) 1958 (In Spanish) [Barcelona, Spain].

Good results with hydrocortisone in the treatment of multiple sclerosis have been reported in the literature (*Rev. neurol.* 94:352 [April] 1956). The authors administered hydrocortisone and vitamin B_6 to 8 patients with multiple sclerosis, in whom the disease was not of the rapidly progressive type. Hydrocortisone was given intraspinally in doses of 25 mg. twice a week up to a total of 10 injections in 5 consecutive weeks. The injections were given very slowly, the patients remaining in bed for 24 hours after their administration. Vitamin

B_6 was given intramuscularly in daily doses of 300 mg. for 40 consecutive days. At the end of the treatment all the patients reported a feeling of well-being. Two patients who were in the stage of aggravation of the disease, with paraplegia of 1-month duration, walked 2 months after discontinuation of the treatment. The Babinski sign was absent, there was only moderate spasticity, and the cutaneous-abdominal reflexes remained abolished. In 5 patients dizziness disappeared, spasticity diminished, and the function of the vesical sphincter became normal. No benefit from the treatment was reported by the patient in whom the disease was of long duration and with important stabilized neurological symptoms. The results appeared permanent in the other patients during a follow-up period of 1 year and 8 months. The occurrence of frequent spontaneous regressions in multiple sclerosis makes it difficult to evaluate the effects of the aforementioned treatment. The authors believe that in this disease hydrocortisone and vitamin B_6 favor the occurrence of spontaneous regressions of long standing through the antiallergic and anti-infectious effects of hydrocortisone on the nervous system and through the regulation of the metabolism of the nervous system by vitamin B_6.

PEDIATRICS

Transplacental Passage of the L. E. Factor. F. Mijer and R. N. Olsen. J. Pediat. 52:690-693 (June) 1958 [St. Louis].

The authors report a case of probable placental transmission of the L. E. factor from mother to infant. The mother had established disseminated lupus erythematosus, and L. E. cells were repeatedly demonstrated in the peripheral blood of the baby up to the age of 7 weeks. Follow-up examination in the outpatient department after the 7th week showed negative results. Conclusions from a single case would be premature; however, there is no evidence to suggest a hypersensitivity phenomenon immediately after birth. Serum complement and gamma-globulin levels in the offspring were within normal range.

Glycogen Storage Disease of the Heart: Clinical Observations in Five Infants. S. Friedman and R. Ash. J. Pediat. 52:635-647 (June) 1958 [St. Louis].

The authors report on findings in 3 male and 2 female infants, between the ages of 2 and 7 months, admitted to the Children's Hospital of Philadelphia with glycogen storage disease of the heart and skeletal muscles. The birth weight of each was above 3,000 Gm. (7 lb.) except for 1 premature infant who was a twin. The age at the time of death ranged from 4½ to 8½ months. Symptoms were first recognized at least 1 month prior to admission in 4 of the 5 patients and in 2 instances dated from the neonatal period. The family history in each of the 5 infants presented evidence of a genetic determination of glycogen storage disease of the heart. Because clinical and pathological findings in the 5 cases are similar, only 1 is illustrated. At the time of admission the diagnostic impression was upper respiratory tract infection, possibly associated with pneumonitis. A roentgenogram of the chest showed cardiac enlargement but no evidence of pneumonia or of increased pulmonary vascular markings. Antibiotic therapy was unsuccessful. A specimen of the left gastrocnemius muscle showed focal areas with marked vacuolation of the cytoplasm of the muscle fibers. Muscle weakness and flaccidity developed and progressed. Because there was some enlargement of the liver and respiratory distress, digitalization was attempted, which resulted in gross arrhythmia. The difficulties arising from large amounts of tenacious mucoid material in the nasopharynx became progressively greater. Frequent aspirations of the nasopharynx failed to afford relief, and tracheotomy had to be performed. The patient died at the age of 4½ months, 1 month after admission. Postmortem examination of the heart, liver, and psoas muscle tissues revealed glycogen of normal structure as well as a normal amount of amylo 1-6-glucosidase, the enzyme which splits the 1-6-glucosidase linkages which produce the branched structure of the glycogen molecule.

Death in all cases resulted from aspiration, pulmonary infection, and other pulmonary complications. In no instance was frank congestive heart failure observed. The most striking physical findings noted in these 5 patients were those of the neuromuscular system. Paucity of spontaneous movements, generalized muscle weakness, and diminished deep tendon reflexes were consistently present and progressive in all patients. Palpation of the involved skeletal muscles in several instances revealed them to be of average, or slightly greater than average, size, with a firm, rubbery consistency suggestive of muscles observed in pseudohypertrophic muscular dystrophy. Electrocardiographic tracings showed abnormalities simulating those found in other primary myocardial diseases of infancy. On the basis of T-wave changes alone, glycogen storage disease cannot be differentiated with certainty from other lesions. However, study of the QRS complexes offers some information which is useful in differentiating the various entities in this group. The presence of generalized muscle weakness in glycogen storage disease should permit its differentiation from interstitial myocarditis. Two roentgenograms were available for each of the 5 infants, the earliest film being taken at the age of 2 months and the latest at 7 months. The cardiac silhouette was strikingly similar among the 5 patients. In all instances, the cardiac shadow was moderately enlarged with a rounded or globular contour in all views, particularly the anteroposterior and the left anterior oblique. The cardiac enlargement in each case was of a diffuse nature with no specific chamber enlargement demonstrable. The diagnosis was best made by carrying out a skeletal muscle biopsy. In each of the 4 cases examined in this way, the muscle fibers showed vacuoles containing material with the staining characteristics of glycogen. Generalized muscle weakness was clinically evident at this time in all 4 cases. The absence of abnormal liver function tests, a normal response to epinephrine, and no response to neostigmine (Prostigmin) bromide were also useful indirect or negative contributions to the diagnosis.

Experiences with Cortisone Treatment in Staphylococcic Pneumonia of Infants and Young Children. I. Bühler, H. Feiler and W. Freislederer. Arch. Kinderh. 157:136-147 (No. 2) 1958 (In German) [Stuttgart, Germany].

Of 47 children with staphylococcic pneumonia, who were treated at the children's clinic of the University of Munich during the 2 years from May, 1955, to May, 1957, 35 received, in addition to the customary antibiotic and general therapy, derivatives of cortisone. Seven of these 35 children received hydrocortisone, 3 cortisone, and the others prednisone. The dosage was adjusted to the age of the patient and the severity of the disease. The authors found that in the case of prednisone the daily dose should not be reduced by more than 2.5 mg. per day. The administration of the cortisone derivative was continued for from 5 to 17 days and in the case of recurrence for from 5 to 20 days. Twenty-four of the children received at the conclusion of treatment, for from 2 to 5 days, long-acting corticotropin. The authors did not gain the impression that the omission of the long-acting corticotropin at the end of the treatment would cause a flare-up of some of the symptoms.

The cortisone derivatives were given only to patients with the severest forms of staphylococcic pneumonia, not to the 12 children who had a milder form. Because of this selective factor and because the cortisone derivatives were not the only medication used, the evaluation of their efficacy is difficult. The death rate was only 9%, which compares favorably with the results published in the world literature. An analysis of the clinical courses indicates that this success may be due to the additional use of the cortisone derivatives. The adrenal cortex hormone seems to exert its favorable effect by counteracting the symptoms of shock and by inhibiting exudation. In the 16 infants, less than 4 months old, who were treated with cortisone derivatives, the results were excellent in 9, good in 4, but largely negative in 3. Of 14 older infants and children, 12 obtained excellent or good results. Corticotropin tolerance tests and analysis by paper chromatography on the corticoid cleavage products in some of the children suggested that the action mechanism of the cortisone derivatives, at least in some of the patients, can be explained as a compensatory effect for adrenocortical dysfunction.

Therapy of Pneumonia with Abscess Formation in Infants (with Particular Consideration of Pseudocysts). G. Bucha. Arch. Kinderh. 157:147-155 (No. 2) 1958 (In German) [Stuttgart, Germany].

Although antibiotics have not proved as effective in suppurative pneumonia of infants as had been expected, about two-thirds of the infants with pneumonia that causes abscesses are now curable. In infants less than 3 months old, with miliary distribution of pulmonary abscesses, the course may be rapidly fatal, as local therapy cannot be employed and systemic treatment with antibiotics may fail, even if the causal organism is sensitive to the antibiotic administered. The most frequent form of abscess resulting from suppurative pneumonia is that which perforates into the pleural cleft and forms a pyothorax or even a pyopneumothorax. Extensive surgery, such as rib resection with open drainage, is now generally dispensed with, and the author also prefers conservative treatment. He recommends daily puncture with cautious removal of the pus and with subsequent instillation of a suspension of an antibiotic (50 to 100 mg. of chlortetracycline [Aureomycin] or tetracycline). This local treatment is so effective that continuous drainage can usually be dispensed with; but, if it should prove necessary, closed drainage is advisable. The author found that, if tension pneumothorax develops, it is usually sufficient to insert a nonsuctioning valve (a rubber tube fitted with a rubber finger-stall or a bicycle valve). Because of the favorable gluing tendency of the internal valve, this valve system can usually be removed within a few days.

The author is particularly concerned with the so-called pseudocysts, which he believes are healed, small abscess cavities that become inflated by their connection with the bronchial tree. As a rule, they require no treatment, because they have a tendency to regress spontaneously. Even when they appear to be stationary for weeks or even months, they will generally regress spontaneously in the course of a year. Only if such pseudocysts develop into a spontaneous pneumothorax as the result of maximal inflation, it becomes necessary to deflate them by the nonsuctioning valve system. This is usually accomplished within a few days. The continuous suction drainage, which has been described by others in the treatment of pseudocysts, is regarded by the author as unnecessary, particularly in infants. He feels that the continuous suction carried on over a period of weeks will exert an unfavorable effect on the internal valve. The prognosis as regards the reinflation of the lung and the regression of the adhesions is very favorable in infants. Of the 67 infants with abscess-forming pneumonia, 27 had pseudocysts and, in addition to this, more or less extensive pleural adhesions. But the general condition of these children was relatively good, and the majority could be discharged for ambulatory treatment. This is a great advantage in view of the present-day tendency of the development of resistant organisms in the hospital environment.

Dried Skimmed Milks and Kwashiorkor. P. J. Pretorius, F. J. P. Retief and S. G. Wiechers. South African M. J. 32:563-565 (May 31) 1958 [Cape Town].

Sixty Bantu infants, admitted to hospital with kwashiorkor, were divided in a random manner into 3 equal groups. During a period of 3 weeks one group was given a roller-dried skimmed milk, another group a spray-dried skimmed milk, and the third group a spray-dried acidified skimmed milk. Initially there was a more rapid rise in the serum albumin content among the patients who received the spray-dried milk than among the remaining patients, but after 3 weeks no significant difference could be detected among the values obtained for the 3 groups. The results, therefore, indicate that roller-dried skimmed milk of high quality which has been properly packed and stored can be as effective in initiating cure as spray-dried skimmed milk either with or without added lactic acid. This finding is of economic importance because drum-drying is cheaper than spray-drying.

PATHOLOGY

A Correlated Histological, Cytological and Cytochemical Study of the Tracheobronchial Tree and Lungs of Mice Exposed to Cigarette Smoke: I. Bronchitis with Atypical Epithelial Changes in Mice Exposed to Cigarette Smoke. C. Leuchtenberger, R. Leuchtenberger and P. F. Doolin. Cancer 11:490-506 (May-June) 1958 [Philadelphia].

The interdependence of cigarette smoking and lung cancer was studied in mice whose tracheobronchial trees were exposed to cigarette smoke with the aid of a specially devised smoking apparatus. The results of correlated histological, cytological, and cytochemical studies of the alterations in the bronchi of these animals made it possible to divide them into 3 groups. The first group consisted of bronchi which did not show significant histological changes. The deoxyribonucleic acid content was normal; and nuclear volumes, tyrosine content, and dry mass were not, or were only slightly, increased. In the second group there was bronchitis with mild proliferative epithelial changes. The deoxyribonucleic acid content was not, or was only slightly, increased; and the nuclear volumes, tyrosine content, and dry mass were frequently increased. In the third group there was bronchitis with marked, often atypical, proliferative changes. Atypical basal-cell hyperplasia, squamous-cell metaplasia, or epithelial dysplasia, in many respects similar to what would be called "carcinoma in situ" in man, were seen. The deoxyribonucleic acid content was increased; and the nuclear volumes, tyrosine content, and dry mass were frequently increased. One or more of these features were occasionally present in different areas of the same bronchus.

The similarity between the epithelial lesions of human cigarette smokers and those of mice exposed to cigarette smoke justifies a cautious optimism as to the validity of the authors' experimental approach. It appears that the exposure of animals to cigarette smoke is a useful tool for the study of the interrelationship of cigarette smoking and cancer, despite the realization that this type of cigarette smoke exposure is different from that in the actual process of cigarette smoking.

Tumors of the Anterior Mediastinum. R. W. O'Gara, R. C. Horn Jr. and H. T. Enterline. Cancer 11:562-590 (May-June) 1958 [Philadelphia].

Of 51 patients, between the ages of 4 months and 80 years, with tumors arising in the anterior mediastinum, who were operated on and whose surgical specimens were studied at the laboratory of surgical pathology of the Hospital of the University of Pennsylvania between 1939 and 1955, 16 had thymomas, 3 had carcinomas of the thymus gland, 4 had non-neoplastic lesions of the thymus gland, 10 had malignant lymphomas, 10 had teratomas and related tumors, and 8 had miscellaneous or unclassified lesions. The thymoma was found to be a distinctive tumor of the anterior mediastinum, composed of variable proportions of lymphocytes and epithelial cells. The patients with encapsulated thymomas had a relatively more benign clinical course than did those with nonencapsulated thymomas. No histopathological characteristics were observed that would distinguish benign from malignant thymomas. Several miscroscopic features proved useful in differentiating thymomas from malignant lymphomas of the anterior mediastinum. These included a characteristic cellular pattern, the spindling of epithelial cells, the presence of characteristic cystic spaces, the relative absence of pleomorphism and fibrosis, and the presence of mature and immature concentric (Hassall's) corpuscles. A distinctive adenomatoid pattern was found in 2 encapsulated and 2 nonencapsulated thymomas.

Clinically, patients with thymomas differed from those with malignant lymphomas. Thymomas occurred in an older age group (average age, 51 years) and were associated with myasthenia gravis in 3 (19%) of the 16 patients with thymomas, who frequently were otherwise asymptomatic. Patients with thymomas had a longer clinical course than did those with malignant lymphomas. Although less responsive to irradiation therapy than the malignant lymphomas, the thymomas did not metastasize. Of the 10 patients with teratomas, 5 had benign cystic teratomas and 5 had malignant teratomas or related tumors. Three of the tumors in the latter group were growing predominantly as seminomas, and the patients showed long-term survival.

PHYSIOLOGY

Role of the Spleen and Effect of Splenectomy in Sickle Cell Disease. C. C. Sprague and J. C. S. Paterson. Blood 13:569-580 (June) 1958 [New York].

The authors determined the erythrocyte survival time by the radioactive chromium (Cr^{51}) method in the circulation of 21 patients with sickle-cell anemia and of 7 patients with sickle-cell hemoglobin (type C) disease and in the circulation of compatible normal recipients to whom sickle cells were transfused. In patients with sickle-cell anemia and enlargement of the spleen, the average half-life time (T½) for erythrocytes was found to be 3.7 days. After splenectomy T½ increased to an average of 11.4 days. In patients with sickle-cell anemia who did not have enlargement of the spleen, the average T½ was found to be 10 days. In 5 patients an average T½ of 9.2 days was found, whereas the average T½ for the same cells in the circulation of normal recipients was 4.4 days. In patients with sickle-cell hemoglobin (type C) disease, the average T½ was 15.7 days. After splenectomy in 2 patients, T½ was unchanged in one and increased in the other. The T½ value was shortened in 2 or 3 cases when these cells were transfused into normal recipients, but the data were insufficient to permit conclusions to be drawn. These data show that the survival time of sickle cells is shortened in the presence of a spleen and lengthened (although still much below normal survival time) after splenectomy. It is not unreasonable to postulate that the rigidity of sickle cells interferes with their passage from the splenic pulp, rendering them even more subject to stagnation and eventually to destruction. In the case of the spleen, which is so constructed that stagnation of blood within its pulp spaces is a normal occurrence, it may be concluded that this organ plays a relatively passive role in sickle-cell anemia, the effect of its presence being to accelerate the hemolytic process. Splenectomy would be expected to effect the removal of a principal organ in which sickle cells tend to stagnate and thereby to effect only a mitigation of the hemolytic process. This concept is compatible with the diminution in the severity of sickle-cell anemia frequently recognized in the adult patient whose spleen has atrophied and in the child after splenectomy. Splenectomy was performed on children in whom the erythrocyte survival time was shortened (T½ less than 6 days).

PUBLIC HEALTH

A Mass Chest Survey at a Naval Station in the Tropics with Notes on Histoplasmosis. S. P. Scalia. Maryland M. J. 7:241-251 (May) 1958 [Baltimore].

At the U. S. Naval Station Rodman in the Canal Zone, 2,185 chest x-rays were taken on 70-mm. film. Those x-rayed included Naval and Marine officers, enlisted personnel and their dependents, and civilian employees of the Navy, most of whom were Panamanians. Among the 900 military personnel x-rayed, only 10 cases (0.09%) with pathological findings were found. Only 4 cases (1.7%) with pathological findings were found among the 23 dependents filmed. Among the 1,052 civilians filmed, 57 cases (5.4%) of disease were discovered. This latter figure represents 1.8% (19) incidence among U. S. civilians and 3.6% (38) incidence among the Panamanian civilians.

The pathological diagnoses totaled 84, although not 1 active case of tuberculosis was found. Several cases of an inactive nature were discovered, all of which had been studied and treated in the past. Since the chest x-ray program was instituted at this facility, there have been 2 cases of active pulmonary tuberculosis discovered per year per 2,000 films. A recent review of 348,875 photofluorograms at the Bureau of Medicine and Surgery disclosed only 63 (0.018%) cases of active pulmonary tuberculosis. This represents the first time that a chest survey at this activity failed to disclose active tuberculosis, a finding that is perhaps more in accord with the tendency toward a world-wide decrease in the incidence of pulmonary acid-fast disease. The finding of histoplasmosis in Americans only (not a single case being found in an adult Panamanian) is, although surprising, in agreement with the recent findings regarding histoplasmosis at the Gorgas Hospital. This disease entity has assumed an important role in the differential diagnosis of chest lesions, since it can so closely mimic pulmonary tuberculosis and malignancy. It has been shown that histoplasmosis is probably the principal cause of pulmonary calcification, and probably the most important cause, as such calcification is so prevalent. Infection with these organisms is postulated as being mild in that these subclinical asymptomatic infections are responsible for the changes seen on x-ray. The differential diagnosis of a lung tumor, a tuberculoma, and a histoplasmoma must often await surgery before it can be resolved, and such was the case in 2 of the cases described here.

BOOK REVIEWS

Electrocardiographic Analysis. Vol. 1: Biophysical Principles of Electrocardiography. By Robert H. Bayley, M.D., Professor of Internal Medicine, Director of Heart Station, University of Oklahoma School of Medicine and University Hospitals, Oklahoma City. Cloth. $8. Pp. 237, with illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16, 1958.

This volume attempts to build the background on which the contour of the clinical electrocardiogram depends. It deliberately neglects the recent work on transmembrane potentials—though mentioning it—and concentrates on the factors that give rise to the surface records. It is based on the excellent work, especially of the Wilson school, on electrical properties in a volume conductor, to which the author has made important contributions. While recognizing the modifications which the work of Frank and Burger, among others, have introduced on the simplified concept of the large homogenous electric volume conductor with a small central source of current generation, the author nevertheless minimizes their influence. His concept of a zero potential electrode has been seriously questioned by some. One wonders, furthermore, how important all the mathematical development may be and whether a verbal or graphic presentation would not have served as well. This would have avoided the tendency to dogmatism which mathematical handling tends to impart to the uninitiated. Perhaps this is inherent in the clinician who turns mathematician. In reading some of the clinical concepts in this volume, the same trend to authoritarianism occurs. These flaws are mentioned because they detract from an otherwise excellent development of the biophysical background of clinical electrocardiography. The book deals with the volume conductor theory applicable to electrocardiographic leads, depolarization of the cardiac fiber and heart mass, properties of vectors, heart hypertrophy and block, infarct of the ventricle and the influence of a broad QRS complex on it, the ventricular gradient and repolarization, primary and secondary T-wave changes, currents of injury, and a summarization of mathematical considerations not otherwise dealt with in the text. There is a profusion of multilead clinical electrocardiograms and illuminating graphs. Careful study of the book builds up a sound concept of the basis of clinical electrocardiography that is missing in many other textbooks. The aim is to make clinical electrocardiograms meaningful, and in this the author succeeds. If there is any complaint, it is in the expanded handling of the subject of the ventricular gradient. This volume cannot be read hastily but requires careful and painstaking study—a study well worth the effort of the reader, whether he be a student or novice in the field, a long established clinical electrocardiographer, or a sophisticate of the electrophysiological background of the subject. A critical study of this volume is a must for anyone desiring to know electrocardiography.

So You Want to Be Psychoanalyzed! By Lucy Freeman. Cloth. $3.50. Pp. 145. Henry Holt & Company, 383 Madison Ave., New York 17; George J. McLeod, Ltd., 73 Bathurst St., Toronto 2B, Canada, 1958.

Almost every physician, regardless of his type of practice, has been asked by a patient, "What is it like to be psychoanalyzed?" Now, at last, the physician can answer his patient's, as well as his own, curiosity with a book that provides unusual insight coupled with readable humor and wit. To offer such a book to one's patients provides as complete and close an excursion through analysis as is possible. The book is divided into three sections, each corresponding to a particular stage of psychoanalysis. The first part, called "I love you, I love you, I love you," describes positive transference where the patient develops a love relationship toward the analyst, a feeling that eventually makes it possible to really love someone else in an enduring, intimate fashion. The second part is called "I hate you, I hate you, I hate you." At this stage negative transference takes over because of the patient's reluctance to face the truth about himself. In the last part, after a summary of life's battles with someone who is not interested solely in "making" or "breaking" the patient, analysis is seen as "the temporary crutch that strengthens you to walk alone." When the patient breaks his childish dependence on his physician-analyst, he has achieved a serenity that could stem from the soul, "out of wisdom born of pain and patience and the belief that the noblest struggle of all is to 'know thyself.' "

Just about any conceivable question concerning the "total" experience of analysis will be found in this book: the use of the couch (which is not a requirement), the number of visits, how long analysis will take, what will be talked about, and the recognition of inward success. The book concludes with a chapter exploding the many myths about analysis along with a flat warning: "Analysis does not guarantee that people turn lovable overnight." The author herself says that psychoanalysis can never be adequately described by words. "Your actions, which sometimes speak far louder than the

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These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

words, convey intangible feelings that elude words but are nonetheless real, just as in the first years of your life you talked with your eyes, the tone of your voice, and the movements of your body, without speaking a word." Despite such a warning, this book does give the physician an opportunity to help his patient, where indicated, to make up his mind to help himself.

Recent Advances in Oto-laryngology. By F. Boyes Korkis, M.B., Ch.B., D.L.O., Surgeon and Dean, Metropolitan Ear, Nose and Throat Hospital, London. With foreword by R. Scott Stevenson, M.D., F.R.C.S. Third edition. Cloth. $12. Pp. 438, with 146 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6, 1958.

This new edition appears nine years after the second. In that time there have been many advances in all fields of medicine, and the author has attempted to summarize the most significant ones in otolaryngology. The book is well written, with clear, concise summarization of important contributions to the literature. It makes no pretense to be a textbook or to cover all of the available literature. Adequate references are given at the end of each chapter. Chapters deal with anesthesia in otolaryngology, audiology, acoustic trauma, the deaf infant, aural vertigo, the surgical treatment of otosclerosis, sinus infections, carcinoma of the larynx, surgical advances in the treatment of middle ear suppuration, labyrinthine tests, facial palsy, the functions of the nose, benign nasal polyps, the nasopharynx, poliomyelitis and otolaryngology, pharyngeal diverticulum, the salivary glands, and the management of some esophageal diseases. The author has undertaken a difficult task and has done a concise and thorough job. This book is not merely a review of the literature; it possesses a wholesome degree of authority. It is printed on good paper, the print is clear, and it is attractively bound.

Standard Methods of Clinical Chemistry. Volume II. By American Association of Clinical Chemists. Editor in chief: David Seligson. Cloth. $5.50. Pp. 217, with illustrations. Academic Press, Inc., 111 Fifth Ave., New York 3, 1958.

As is volume 1 of this series, this book is a collection of clinical laboratory test methods developed by various workers in the field. Each monograph is listed as having been submitted by a specific author, and the names of the referees who have "verified" the method in their own laboratories are given. The styles of the individual monographs vary somewhat, but in general each contains (1) an introduction which gives the historical development and use of the method; (2) the principles underlying the chemical reaction used; (3) the reagents used and specific directions for their preparation; (4) a procedure which gives detailed directions for conducting the test; (5) calculation of the results; and (6) results and discussion. The discussion of each method is followed by a list of references on the method and other methods for determining the constituent under consideration. Some of the methods given are simple procedures that are applicable for routine use. Others are more complex and are intended for use as "reference" methods to check the more simple routine procedures for accuracy. The tests for which monographs are included in volume 2 are those for calcium (compleximetric), cephalin-cholesterol flocculation, chloride, cholesterol in serum, total fatty acids in stool, gamma globulin in serum, hemoglobin, free and conjugated 17-hydroxycorticosteroids in plasma, iron in serum, 17-ketosteroids in urine, pancreatitis-lipase, nitrogen by the Kjeldahl method, nonprotein nitrogen, determination of blood pH, alkaline and acid phosphatase, phosphatides in plasma, porphyrins in urine, protein-bound iodine in serum, sodium and potassium by flame photometry, sulfobromophthalein (BSP) in serum, and urobilinogen in urine and feces. In some of the monographs, alternate methods are given. The style of these monographs should make the book useful at several levels of interest. For the clinical technician it provides a manual of methods containing specific and detailed procedures. The informal notes spaced throughout the text give words of caution and the simple modifications possible. The information given in the sections on principles and discussion, as well as the references, should make the book a valuable addition to the library of the clinical chemist and pathologist.

Milestones in Modern Surgery. By Alfred Hurwitz, M.D., Professor of Surgery, State University of New York College of Medicine at New York City, and George A. Degenshein, M.D., Assistant Attending Surgeon, Maimonides Hospital, Brooklyn. With foreword by J. Englebert Dunphy, M.D., Professor of Surgery, Harvard Medical School, Boston. Cloth. $15. Pp. 520, with illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16, 1958.

The authors, in choosing the original contributions that in their judgment constitute the "milestones," adopted the following criteria: the article must represent a significant advance in surgery; it must demonstrate the scientific method; and the principle or method described should still be of current value. Twenty-eight were chosen. Each is preceded by a short biographical sketch and a portrait of the author. The original purpose of this volume was to fill a gap in the resident training program. The authors have accomplished much more, for the volume should also be of interest to the mature surgeon, the general practitioner, the specialists in the various branches of medicine, and, in particular, those interested in the history of medicine. The choice of contributions, keeping in mind that the leading idea was emphasis on the principles of surgery, was a happy one. The volume is rounded out by Milestones on the Horizon, in which the story of the development of the extracorporeal pump and renal homotransplantation is told. The volume is a worthwhile addition to the history of surgery and medicine.

QUESTIONS AND ANSWERS

SIMPLE CHRONIC ANEMIA

To the Editor:—*Please suggest treatment for a patient whose laboratory test shows red blood cells, 4,050,000 per cubic millimeter; hemoglobin level, 12 Gm. per 100 cc. (normal, 13-16 Gm.); white blood cells, 8,800 per cubic millimeter, with polymorphonuclear cells, 42%, lymphocytes, 48%, and monocytes, 4%. Examination shows no other objective symptoms; the only subjective symptom is slight fatigue on exertion.*

James T. Maxwell, M.D., Omaha, Neb.

Answer.—The data suggest that the patient has a mild normochromic, normocytic anemia of the type designated as simple chronic anemia. This is one of the most frequent of all anemias, resulting from depressed red blood cell formation and often from a somewhat greater than normal rate of red blood cell destruction. The causes are many: chronic infection, renal disease, certain endocrine hypofunctional states, tumors, rheumatoid arthritis, liver disease, and others. Correction of the anemia depends on recognition and successful treatment of the disease to which the anemia is secondary. The anemia will not respond to the administration of iron, vitamin B_{12}, folic acid, or any of the "shot gun" antianemic preparations which, unfortunately, flood the pharmaceutical market. Two other possibilities must be mentioned: 1. The anemia could be primarily hemolytic with fairly good compensation by the marrow. Additional information would be required to eliminate or establish that possibility, i. e., reticulocyte count and plasma bilirubin level. 2. If the patient is a woman, the values quoted may possibly be normal; a small percentage of apparently normal women have red blood cell levels of 4 million per cubic millimeter and hemoglobin values of 12 Gm. per 100 cc. In any event, additional diagnostic studies are necessary. It occasionally is true that the most critical diagnostic evaluation fails to reveal the cause of the complaints or of the mild anemia. Under these circumstances, the patient's confidence should be won enough to permit further observation by the physician. With time, usually the anemia will disappear or its cause will become evident.

EAR ECZEMA AND PREGNANCY

To the Editor:—*A 35-year-old woman has had severe eczema of the ear canal for about five years. The interesting thing is that this came on during her first pregnancy, which resulted in a girl. It has continued with recurrent severe attacks since then, except for remissions during two pregnancies which resulted in boys. She has recently given birth to another girl, and during this last pregnancy her ear condition became much worse. Does this indicate that she has some hormonal imbalance that may account for the external otitis? Many types of treatment have been used, all with little success. She is a nervous individual, but can this condition be on a neurogenic basis?*

Wells C. Carey, M.D., Eureka, Calif.

Answer.—Hormonal influences in various forms of eczema are well known; these include aggravation during menstruation, improvement or aggravation during pregnancy, and the frequent origin of contact dermatitis during the climacterium. Although this consultant has seen different effects of pregnancies in the same woman, such as aggravation during one and improvement during another, a report has never been seen in which the difference depended on whether the pregnancy resulted in a boy or girl. It is not known what, if any, hormonal imbalance may account for such an occurrence.

EXCLUSION GASTRECTOMY

To the Editor:—*It has long been known that removal of a large portion of the fundus of the stomach, with its acid-bearing glands, is apt to be followed by peptic ulceration, whereas removal of the pylorus protects against ulceration. (There is, however, some recent work which shows that the pyloric region can have some inhibitory effect on gastric secretion.) At times, the surgeon is compelled to leave the pylorus in situ as a blind pouch, the so-called exclusion operation. Because this operation is apt to be followed by peptic ulceration, some surgeons remove the mucous membrane of the pylorus before closing it. Is there any evidence that this procedure is effective in preventing ulcer disease or recurrence?*

M.D., West Virginia.

Answer.—Following the exclusion gastrectomy, regurgitation of food substances and alkaline secretions through the afferent jejunal loop, duodenum,

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

and eventually through the pylorus into the excluded antrum has been demonstrated both experimentally and in man. The neutral food substances excite the antrum both chemically and mechanically to release gastrin, which in turn stimulates the secretion of acid gastric juice by the gastric remnant. Since the acid does not flow over the antrum mucosa, the normal inhibitory effect on gastrin release is negated. As a result, a hypersecretion of acid gastric juice of humoral origin occurs and is frequently followed by recurrent peptic ulceration. Evidence from the laboratory indicates that both chemical and mechanical stimuli are capable of causing the release of gastrin. With removal of the pyloric antral mucosa, chemical stimulation is abolished. The effect of mechanical stimulation of the antrum is abolished by the application of local anesthetics to the mucosa, which suggests that the intramural nerve tissue of the antrum is important in gastrin release. It has been demonstrated histologically that, when one removes the mucous membrane of the antrum, the submucous plexus (Meissner's plexus) is disrupted and probably destroyed, thus preventing mechanical stimuli from exciting the gastrin mechanism. It is theorized from experimental data that gastrin may arise from the submucous intramural nerve plexus, although conclusive evidence is lacking at present. The incidence of marginal ulcer has been reduced since the adoption of Bancroft's procedure of excising the antrum mucosa when it is necessary to transect the stomach proximal to the pylorus in doing gastrectomy for duodenal ulcer.

THE UNFORGIVABLE SIN

To the Editor:—*The question regarding the unforgivable or unpardonable sin, answered in* The Journal *for March 8, 1958, page 1262, is one frequently encountered. The consultant correctly differentiated between original sin and the unforgivable sin, but his definition of the latter was not correct according to the Bible. The passages referring to the unpardonable sin are found in Matthew 12:22-37, Mark 3:22-30, and Luke 11:14-23. A study of these will reveal what was stated, that it is a sin against the Holy Spirit Himself. But it is not a case of "stifling" or "ignoring" Him until one becomes "amoral, beyond reach, and lost." It is not directly connected with one's conscience. The unpardonable sin is committed when one deliberately and knowingly attributes to the devil that which could only have been the work of the Holy Spirit. It is "the blasphemy against the Holy Spirit" of which the Pharisees were guilty when they said, "This fellow (Jesus) doth not cast out demons, but by Beelzebub the prince of the demons" (Matthew 12:24). They were ascribing to Satan that which was the work of God. A careful reading of the Bible passages given above will make this quite clear. Although this sin can be committed today, it does not seem likely that a person in deep concern of soul over it could have been guilty of it.*

Herbert T. Liefeld, M.D.
90-30 148 St.
Jamaica 35, N. Y.

The above comment was referred to the consultant who answered the original query, and his reply follows.—Ed.

To the Editor:—*It is true that the remarks about the unforgivable sin are found in connection with the criticism that Jesus had cast out demons through Beelzebub. But it is not credible that the people who said this really believed that Jesus was doing it by the finger of God and yet "deliberately and knowingly" attributed it to the devil. They sincerely believed that he was doing it by the devil, and Jesus saw that they could only make such an assertion by stifling their own perception of God. This is the sin against the Holy Ghost. To know that a thing is from God but to say it is from the devil is just to tell a lie and an inconceivable lie at that. No one would dare say such a thing if he really believed that what he saw was God's action. It is just by ignoring the promptings of God in one's heart that one confuses God and the devil and thus becomes "amoral, beyond reach, and lost." As we all agree, no one with a troubled conscience has committed the unforgivable sin. And anyone with a troubled conscience should consult his minister, priest, or rabbi and dwell on the many offers of forgiveness in the Bible. Or, if the guilt feelings are pathological, he must see a doctor.*

HIATUS HERNIA

To the Editor:—*In* The Journal, *May 3, 1958, page 144, a question was concerned with the mechanism of symptoms similar to those of angina pectoris in patients having a hiatus hernia. The answer should have mentioned the frequent occurrence of hypochromic anemia in this condition, with the reduced oxygen carrying capacity of the blood accounting in some cases for the clinical picture of angina pectoris.*

Raymond Schaus, M.D.
56, grand-rue
Luxembourg, Europe.

The above comment was referred to the consultant who answered the original query, and his reply follows.—Ed.

To the Editor:—*It is true that retrosternal distress due to the reduced oxygen carrying capacity of the blood in hypochromic anemia may be confused with the pain of angina pectoris. However, the chief cause of the difficulty in diagnosis is the pain caused by peptic esophagitis or distention of the intrathoracic portion of the stomach.*

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Defense Department Retains Medical Assistant Secretary . .

President Criticizes Union Welfare Fund Act But Signs It . .

Preventable Infectious Diseases Big Problem in Near East . .

UMW Claims Saving Through Restricting Freedom of Choice . .

MEDICAL ASSISTANT SECRETARY POST RETAINED IN DEFENSE DEPARTMENT

The administration and the Pentagon now have agreed to retain the post of Assistant Secretary for Health and Medical Affairs in the impending reorganization of the Defense Department. Until announcement of this decision by Defense Secretary McElroy it was understood the post would be down-graded to that of special assistant to the Secretary.

Under a reorganization plan passed by Congress, the Secretary was authorized to eliminate one Assistant Secretary post. The American Medical Association had opposed the elimination in appeals to both Senate and House committees earlier in the year, and, after passage of the bill, to the administration and the department.

In a letter addressed to the House Armed Services Committee, A. M. A. Executive Vice President Blasingame noted that the position was created in 1953, after four years experience with a special assistant in charge of the work. He explained that under the Assistant Secretary system, "an enviable record of increased efficiency and economy has been established" in military medicine.

Dr. Richard L. Meiling testified before the Senate Armed Services Committee, declaring in part: "It is the considered opinion of the American Medical Association that to abolish or downgrade the position of the Assistant Secretary of Defense (health and medical) would have a most deleterious effect at all echelons within the Defense organization upon the medical and health services of our armed forces and upon the morale of military personnel."

PRESIDENT SIGNS UNION WELFARE FUND ACT BUT CRITICIZES IT

Although signing into law a bill to require a certain amount of publicity for union and union-management health and welfare funds, President Eisenhower described it as inadequate to correct known abuses and said it should be strengthened by the next Congress.

Under the law, the only labor legislation to pass the last Congress, funds that are an outgrowth of collective bargaining are required to register with the Secretary of Labor, make annual reports and file one copy with the Secretary, and open their financial books to any beneficiaries.

In criticizing the measure as too weak, Mr. Eisenhower said in part:

1. The act requires only summary statements of many important aspects, "making it possible to conceal many abuses."

2. No agency of government is authorized to provide uniform interpretation of the bill's technical terms, and "the chaos that will result is obvious." Failure to designate an agency which plan administrators can consult for reliable and authentic opinions, and for report forms, "enables corrupt administrators to hide abuses, blocks beneficiaries from receiving adequate information, and subjects administrators to uncertainties in compliance."

3. The bill's reliance solely upon individual employees to compel compliance through court proceeding is most unrealistic. "Employee suits alone are inadequate as enforcements remedies. Unaided by governmental authority to conduct investigations and institute litigation, individual employees, without financial resources or legal experience, can be easily intimidated, made subject to reprisals and discouraged from taking effective action."

4. The bill fails to give the Secretary of Labor either investigatory or enforcement powers with respect to reports filed with him.

5. There is no provision for dealing directly with "the most flagrant abuses," such as embezzlement and kickbacks, once they are uncovered.

In conclusion the President said: "Not only did the Congress fail to appropriate any money to administer the custodial and other functions of the Secretary under the bill, but the annual financial reports will not have to be furnished until as late as May, if the plans are on a calendar year basis or for a period of 120 days after the completion of the fiscal year if they operate on a fiscal year basis."

PREVENTABLE INFECTIOUS DISEASE IS BIG PROBLEM IN NEAR EAST

In connection with President Eisenhower's appeal for an all-out effort by all nations to control disease in the Near East, the U. S. Public Health Service says that "preventable infectious disease continues to be the predominant health problem of the area. General death rates remain distressingly high—in Egypt, for instance, being

(Continued on page 30)

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Lown, B., and Levine, S. A.:
Current Concepts in Digitalis Therapy, Boston,
Little, Brown & Company, 1954, p. 23, par. 2.

double that of the United States. The reported infant death rate in that country is 148 in the first year of life per 1,000 live births, as compared to 25 in the United States."

The President made his appeal during his address to the United Nations General Assembly at the special meeting called to stabilize the Near East. He declared:

"Another great challenge that faces us is disease. There is substantial effort among the people and governments of the Near East to conquer disease and disability. But much more remains to be done. The United States is prepared to join with other governments and the World Health Organization in an all-out joint attack on preventable disease in the Near East."

The World Health Organization's regional office for the eastern Mediterranean attempts to assist 13 countries extending from Tunisia to Pakistan and from the Mediterranean to Ethiopia and Sudan. Last year WHO carried out 88 projects in this area, including technical assistance for control of communicable diseases such as malaria and schistosomiasis, development of health services, training of personnel, and improvement of sanitation services.

In 1957 WHO provided 155 international fellowships to professional personnel in the area for study abroad.

The Internation Cooperation Administration, with the technical assistance of the Public Health Service, at present is supplying technical aid to Iraq, Libya, and Jordan and in the past has helped Egypt, Lebanon, and Saudi Arabia.

Since 1945 the U. S. Navy has maintained a medical research unit at the Abbassya Fever Hospital in Cairo, which contributes to the understanding of the communicable diseases of the Middle East.

MINE WORKERS FUND CITES MEDICAL SAVINGS

Limiting the free choice of physicians and trimming back on the stay in hospitals are credited with a 2.4% drop in the total cost of hospital and medical care under the United Mine Workers Welfare and Retirement Fund. This is a major point in the annual report of the fund for the fiscal year ending last June 30. Savings in dollars were placed at $1,448,909, "notwithstanding the sharp increase in such costs throughout the nation."

The fund said the reduction actually was effected during the last nine months of the fiscal year as a result of professional procedures adopted in October, 1957, by the fund "in compliance with its basic obligation to control and administer all benefit programs in the best interests of the trust and its beneficiaries."

These procedures, the report explained, limit trust fund payments to doctors and hospitals whose services are determined by the fund's medical, health, and hospital service to be necessary and essential in providing fund-authorized hospital and medical care benefits.

"Adoption of these procedures by the fund was mandatory on the basis of evidence that by no other means could there be established measures insuring fund payment of hospital and medical benefits in conformity with quality and cost requirements of trust fund regulations," the report declared.

The fund said its files are "replete with evidence showing that the primary quality and cost requirements of trust fund regulations were not being met under the previous free-choice-of-physician arrangements whereby the fund had permitted the beneficiary free choice of physician and had paid every physician so chosen for any service he billed the fund and had allowed him to hospitalize any beneficiary at fund expense whenever and for as long as he desired."

This data, the report added, "demonstrated that beneficiaries were not receiving the best available medical care, that surgical diagnoses and operative surgery for many fund beneficiaries were inferior in quality, and the amount of surgery performed on beneficiaries was far in excess of that performed on others, that many beneficiaries were sent to the hospital who did not need hospitalization and were kept in the hospital longer than necessary."

AIR POLLUTION CONFERENCE SET FOR NOV. 18-20

A group of experts on the subject of air pollution will meet Nov. 18 to 20 in Washington to discuss effects of air pollution on health, control methods, economic factors, and other aspects of the problem.

Plans for the meeting were discussed at a Washington session attended by Public Health Service officials and chairmen and co-chairman of the six discussion panels.

Plenary sessions of the November meeting will be addressed by scientists, industrialists, and government officials. At group meeting recommendations will be made for future action.

Discussing the problem, acting Surgeon Gen. John D. Porterfield declared:

"The modern air pollution problem . . . cannot be dealt with by traditional smoke abatement programs alone. It is our hope that the conference will assess the problem realistically and chart a program for the future, with specific goals both in research and in control activities.

Chairmen of discussion groups and subjects are Dr. Arie J. Haagen-Smith, California Institute of Technology, Extent of Air Pollution; S. L. Hanauer, New York City department of air pollution control, Sources of Air Pollution; Dr. John T. Middleton, University of California citrus experiment station, Economic Effects of Air Polution; Dr. Malcolm H. Merrill, California department of public health, Health Effects of Air Pollution; and Dr. Leslie Silverman, Harvard School of Public Health, Control Methods and Procedures for Air Pollution.

MISCELLANY

The country's total school and college enrollment, including medical schools, will reach an all-time peak of about 45 million in the current academic year, according to the Office of Education. Enrollment will increase for the 14th straight year. Colleges and universities are expected to enroll about 173,000 more students than they did last year, a new total of 3,623,000.

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MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. F. J. L. Blasingame, 535 North Dearborn St., Chicago 10, Executive Vice President.
1958 Clinical Meeting, Minneapolis, Dec. 2-5.
1959 Annual Meeting, Atlantic City, June 8-12.
1959 Clinical Meeting, Dallas, Texas, Dec. 1-4.

AMERICAN

September

AMERICAN ACADEMY FOR CEREBRAL PALSY, Sheraton-Biltmore Hotel, Providence, R. I., Sept. 25-27. Dr. Raymond R. Rembolt, University Hospitals, Iowa City, Ia., Secretary.

AMERICAN COLLEGE OF PHYSICIANS, Mid-West Regional Meeting, Milwaukee, Wis., Sept. 27. Dr. Joseph F. Rastetter, Milwaukee General Hosp., Milwaukee 13, General Chairman.

AMERICAN FRACTURE ASSOCIATION, Skirvin Hotel, Oklahoma City, Okla., Sept. 29-Oct. 4. Dr. H. W. Wellmerling, 610 Griesheim Bldg., Bloomington, Ill., Secretary.

AMERICAN MEDICAL WRITERS' ASSOCIATION, Hotel Morrison, Chicago, Sept. 26-27. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

AMERICAN ROENTGEN RAY SOCIETY, Shoreham Hotel, Washington, D. C., Sept. 27-Oct. 3. Dr. C. Allen Good, 200, 1st St., S. W., Rochester, Minn., Secretary.

COLORADO STATE MEDICAL SOCIETY, Broadmoor Hotel, Colorado Springs, Sept. 24-27. Mr. Harvey T. Sethman, 1612 Tremont Place, Denver 2, Executive Secretary.

KANSAS CITY SOUTHWEST CLINICAL SOCIETY, Municipal Auditorium, Kansas City, Mo., Sept. 22-25. Mr. A. L. Bingham, 3036 Gillham Rd., Kansas City 8, Mo., Executive Secretary.

KENTUCKY STATE MEDICAL ASSOCIATION, Brown Hotel, Louisville, Sept. 23-25. Mr. J. P. Sanford, 1169 Eastern Parkway, Louisville 17, Executive Secretary.

MICHIGAN STATE MEDICAL SOCIETY, Sheraton-Cadillac Hotel, Detroit, Sept. 30-Oct. 3. Dr. L. Fernald Foster, 606 Townsend St., P. O. Box 539, Lansing, Mich., Secretary.

MISSISSIPPI VALLEY MEDICAL SOCIETY, Morrison Hotel, Chicago, Sept. 24-26. Dr. Harold Swanberg, 510 Main St., Quincy, Ill., Secretary.

TENNESSEE VALLEY MEDICAL ASSEMBLY, Read House, Chattanooga, Tenn., Sept. 29-30. Dr. Harry A. Stone, 109 Medical Arts Bldg., Chattanooga 2, Tenn., Secretary.

TEXAS ACADEMY OF GENERAL PRACTICE, San Antonio, Tex., Sept. 22-24. Mr. Donald C. Jackson, 1905 N. Lamar, Austin, Tex., Executive Secretary.

October

ACADEMY OF PSYCHOSOMATIC MEDICINE, Park Sheraton Hotel, New York, Oct. 9-11. For information write: Dr. Bertram B. Moss, Suite 1035, 55 E. Washington St., Chicago 2.

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY, Palmer House, Chicago, Oct. 12-17. Dr. W. L. Benedict, 100 First Avenue Bldg., Rochester, Minn., Secretary.

AMERICAN ACADEMY OF PEDIATRICS, Palmer House, Chicago, Oct. 20-23. Dr. E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill., Executive Secretary.

AMERICAN ASSOCIATION OF MEDICAL CLINICS, Palace Hotel, San Francisco, Oct. 2-4. Dr. John R. Hand, 1216 Southwest Yamhill St., Portland, Ore., Secretary.

AMERICAN ASSOCIATION OF MEDICAL RECORD LIBRARIANS, Statler Hotel, Boston, Oct. 13-16. Miss Doris Gleason, 510 N. Dearborn St., Chicago 10, Executive Director.

AMERICAN ASSOCIATION OF PUBLIC HEALTH PHYSICIANS, St. Louis, Oct. 27-31. Dr. Joseph M. Bistowish, P. O. Box 1117, Tallahassee, Fla., Secretary.

AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA, Drake Hotel, Chicago, Oct. 2-4. Dr. William T. Fitts, Jr., 3400 Spruce St., Philadelphia 4, Secretary.

AMERICAN CLINICAL AND CLIMATOLOGICAL ASSOCIATION, Otesaga Hotel, Cooperstown, N. Y., Oct. 9-11. Dr. Marshall N. Fulton, 124 Waterman St., Providence 6, R. I., Secretary.

AMERICAN COLLEGE OF GASTROENTEROLOGY, Jung Hotel, New Orleans, Oct. 19-25. Mr. Daniel Weiss, 33 W. 60th St., New York 23, Executive Secretary.

AMERICAN COLLEGE OF SURGEONS, Conrad Hilton, Chicago, Oct. 6-10. Dr. Michael L. Mason, 40 E. Erie St., Chicago, Secretary.

AMERICAN DIETETIC ASSOCIATION, Bellevue-Stratford Hotel, Philadelphia, Oct. 21-24. Miss Ruth M. Yakel, 620 N. Michigan Ave., Chicago 11, Executive Secretary.

AMERICAN HEART ASSOCIATION, Fairmont Hotel, San Francisco, Oct. 24-28. Mr. John D. Brundage, 44 E. 23d St., New York 10, Secretary.

AMERICAN OTORHINOLOGIC SOCIETY FOR PLASTIC SURGERY, Conrad Hilton Hotel, Chicago, Oct. 12. Dr. Joseph G. Gilbert, 75 Barberry Lane, Roslyn Heights, N. Y., Secretary.

AMERICAN PUBLIC HEALTH ASSOCIATION, Kiel Auditorium, St. Louis, Oct. 27-31: Dr. Berwyn F. Mattison, 1790 Broadway, New York 19, Secretary.

AMERICAN SCHOOL HEALTH ASSOCIATION, St. Louis, Oct. 26-31. Dr. A. O. DeWeese, 515 E. Main St., Kent, Ohio, Secretary.

AMERICAN SOCIETY OF ANESTHESIOLOGISTS, Penn-Sheraton Hotel, burgh, Oct. 19-24. Dr. J. Earl Remlinger, 802 Ashland Ave., Ill., Secretary.

AMERICAN SOCIETY OF PLASTIC AND RECONSTRUCTIVE SURGERY, Hotel, Chicago, Oct. 12-17. Dr. Kenneth L. Pickrell, Duke Univ. Durham, N. C., Secretary.

AMERICAN SOCIETY FOR THE STUDY OF ARTERIOSCLEROSIS, Hotel comb, San Francisco, Oct. 24-26. Dr. O. J. Pollak, P. O. Box 228, Del., Secretary.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES, Ocean House, Mass., Oct. 13-15. Dr. Richard H. Young, 303 E. Chicago Ave., cago, Secretary.

ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS OF AMERICA, Hotel, Hartford, Conn., Oct. 22-24. Dr. Royal S. Schaaf, P. O. Box Newark 1, N. J., Secretary.

ASSOCIATION OF MEDICAL ILLUSTRATORS, Adolphus Hotel, Dallas, Oct. 6-8. Miss Rose M. Reynolds, 42d & Dewey Ave., Omaha 5, retary.

ASSOCIATION OF STATE & TERRITORIAL HEALTH OFFICERS, Hotel ington, Washington, D. C., Oct. 22-24. Dr. Mack I. Stanboltz, Office Building, Richmond, Va., Secretary.

CENTRAL ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS, Leamington, Minneapolis, Oct. 2-4. Dr. Edwin J. DeCosta. 104 S. gan Ave., Chicago 3, Secretary.

CENTRAL NEUROPSYCHIATRIC ASSOCIATION, Deshler Hilton Hotel, bus, O., Oct. 17-18. Dr. Ralph M. Patterson, Ohio State Univ., of Med., Columbus 10, O., Secretary.

CENTRAL SOCIETY FOR CLINICAL RESEARCH, Drake Hotel, Chicago, 31-Nov. 1. Dr. Austin S. Weisberger, 2065 Adelbert Rd., Cleveland Secretary.

CLINICAL ORTHOPAEDIC SOCIETY, Brown Palace Hotel, Denver, Oct. Dr. Charles H. Franz, 1801 Wealthy St. S. E., Grand Rapids, Secretary.

CONGRESS OF NEUROLOGICAL SURGEONS, St. Francis Hotel, San F Oct. 29-Nov. 1. Dr. Richard L. DeSaussure, 899 Madison Ave., phis, Tenn., Secretary.

EASTERN PSYCHIATRIC RESEARCH ASSOCIATION, INC., Brooklyn State Brooklyn, N. Y., Oct. 23-24. For information write: Dr. David Impastato, 40 Fifth Ave., New York.

GULF COAST CLINICAL SOCIETY, Pensacola, Fla., Oct. 23-24. Dr. J. Baehr, Jr., 117 N. Palafox St., Pensacola, Fla., Secretary.

INDIANA STATE MEDICAL ASSOCIATION, Murat Temple, Indianapolis, 13-15. Mr. James A. Waggener, 23 E. Ohio St., Indianapolis 4, tive Secretary.

PENNSYLVANIA, MEDICAL SOCIETY OF THE STATE OF, Bellevue-Stratford Philadelphia, Oct. 12-17. Mr. Lester H. Perry, 230 State St., Harrisburg Executive Director.

MEDICAL SOCIETY OF VIRGINIA, Hotel Jefferson, Richmond, Oct. 12-1 Mr. Robert I. Howard, 1105 W. Franklin St., Richmond 20, Secretary.

MISSISSIPPI VALLEY CONFERENCE ON TUBERCULOSIS, Biltmore Hotel, Dayton, Ohio, Oct. 15-18. Mrs. Augustus K. Maxwell, 1412 W. Washington Blvd., Chicago 7, Secretary.

NATIONAL PROCTOLOGIC ASSOCIATION, Hamilton Hotel, Chicago, Oct. Dr. George E. Mueller, 59 E. Madison St., Chicago 2, Secretary.

NORTH CENTRAL MEDICAL CONFERENCE, Hotel Leamington, Minneapolis, Oct. 11-12. Mr. R. R. Rosell, 496 Lowry Medical Arts Building St. Paul 2, Minn., Secretary.

OKLAHOMA CITY CLINICAL SOCIETY, Biltmore Hotel, Oklahoma City, Okla. Oct. 27-29. Mrs. Alma O'Donnell, 503 Medical Arts Bldg., Oklahoma City, Okla, Executive Secretary.

SOUTHWESTERN MEDICAL ASSOCIATION, Pioneer Hotel, Tucson, Ariz., Oct. 23-25. Dr. Russell L. Deter, 1501 Arizona St., El Paso, Tex., Secretary.

WESTERN INDUSTRIAL MEDICAL ASSOCIATION, San Francisco, Oct., Dr. A. C. Remington, 9851 Sepulveda Blvd., Los Angeles 45, Secretary.

WESTERN ORTHOPEDIC ASSOCIATION, Multnomah Hotel, Portland, Ore., Oct. 22-25. Dr. Eldon G. Chuinard, 1922 N. W. Johnson, Portland 9, Ore., Secretary.

November

AMERICAN ASSOCIATION OF BLOOD BANKS, Netherlands Plaza Hotel, Cincinnati, Nov. 20-22. Dr. John B. Alsever, 1211 W. Washington, Phoenix, Ariz., Secretary.

AMERICAN COLLEGE OF CARDIOLOGY, INTERIM MEETING, Jung Hotel, New Orleans, La., Nov. 20-22. Dr. Philip Reichert, Empire State Bldg., New York 1, Secretary.

AMERICAN DENTAL ASSOCIATION, Memorial Auditorium, Dallas, Tex., 10-13. Dr. Harold Hillenbrand, 222 E. Superior St., Chicago 11, Secretary.

AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS, Congress Hotel, Nov. 2-8. Dr. Clyde G. Culbertson, Indiana Univ. Med Center, Michigan St., Indianapolis, Secretary.

AMERICAN SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Hotel ville, Miami Beach, Fla., Nov. 4-7. Dr. R. B. Hill, 3575 St. Gaudens Miami 33, Fla.

ASSOCIATION OF MILITARY SURGEONS OF THE U. S., Hotel Statler, ington, D. C., Nov. 17-19. Col. Robert E. Bitner, 1726 Eye St., N. W., Washington 6, D. C., Secretary.

COLLEGE OF AMERICAN PATHOLOGISTS, Congress Hotel, Chicago, Nov. Dr. A. H. Dearing, Prudential Plaza, Suite 2115, Chicago 1, Secretary.

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PRACTICAL MANAGEMENT OF AORTIC STENOSIS

Robert P. Glover, M.D.
and
Howard L. Gadboys, M.D., Philadelphia

Aortic stenosis is a more difficult problem than mitral stenosis, and it should be treated before it progresses to the stage of impending left ventricular failure. Five stages in its evolution can be recognized and are here described. Ideally, surgical treatment should be undertaken at stage 2, when the patient becomes subjectively aware of his forceful heart action, has palpitations, and is easily fatigued. He should not be allowed to go beyond stage 3, marked by spells of dizziness, syncope, substernal discomfort, effort-angina, and dyspnea. These opinions are based on a study of 78 patients. The first 37 were operated on with a three-bladed expandable split-dilator inserted through the apex of the left ventricle. The other 41 were operated on by a greatly refined transventricular technique, and the improvement in results is strikingly shown by the lower mortality figures, the degree of symptomatic relief, and the better occupational adjustment of the patients. Present methods of selecting patients and performing the operation result in a mortality of only 5% and give functional amelioration in approximately 70% of the patients. Further improvements are anticipated.

EVERY physician during the course of his practice has been presented with the problem of the failing myocardium resulting from the mechanical obstruction posed by rheumatic (or otherwise acquired) aortic stenosis. It has long been recognized that, of the stenotic valvular deformities, this lesion, despite years of experimental and clinical study, has remained singularly more resistant to therapeutic control than any other, whether the measures employed were medical or surgical. In the light of experience gained during the first decade of intracardiac valvular surgery, the multiplicity of reasons for this state of affairs has become increasingly clear and should basically be recognized by the physician and surgeon alike. What is this experience?

Pathologically, there is an early fusion of the three valve cusps, the margins of which become thickened, rolled, eburnated, and infiltrated with calcium very early in the course of the disease. This is due in part to the rheumatic origin of the disease itself but also and perhaps more particularly to the location of this valve in the course of the blood stream. The valve lies in a confined space of small diameter and is the recipient of the full head of vascular pressure from the strongest of the contracting cardiac chambers, the left ventricle.

The factor of vascular trauma is, therefore, of great importance, for, after initial fibrotic agglutination of the cusp margins, there is a constant and

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Director, the Thoracic and Cardiovascular Research Laboratory at Presbyterian Hospital; Chief of Thoracic and Cardiovascular Surgery at Presbyterian, Episcopal, and Fitzgerald Mercy hospitals and St. Christopher's Hospital for Children; Assistant Professor of Clinical Surgery, University of Pennsylvania Medical School (Dr. Glover); and Postdoctorate Research Fellow, National Heart Institute, U. S. Public Health Service, at the Presbyterian Hospital, Department of Thoracic and Cardiovascular Surgery (Dr. Gadboys).

steady deposition of traumatic elements, such as fibrin and calcium, from which there can be no relief. Thus, calcification develops early, and as the leaflets are relatively small in surface area almost complete immobility and fixation may rapidly eventuate. Some flexibility of the cusps at their attachment to the aortic ring may remain for a time, but this is less prominent than that seen in the stenotic mitral valve. This factor of trauma no doubt partially explains the fact that the anteromedial leaflet of the mitral valve, also called the aortic or septal leaflet, is the seat of the greatest calcification in mitral stenosis, for it lies nearest the aortic ring in the high-flow pressure left ventricular outflow tract, and it also receives the brunt of vascular ejection at the time of left ventricular contraction (fig. 1).

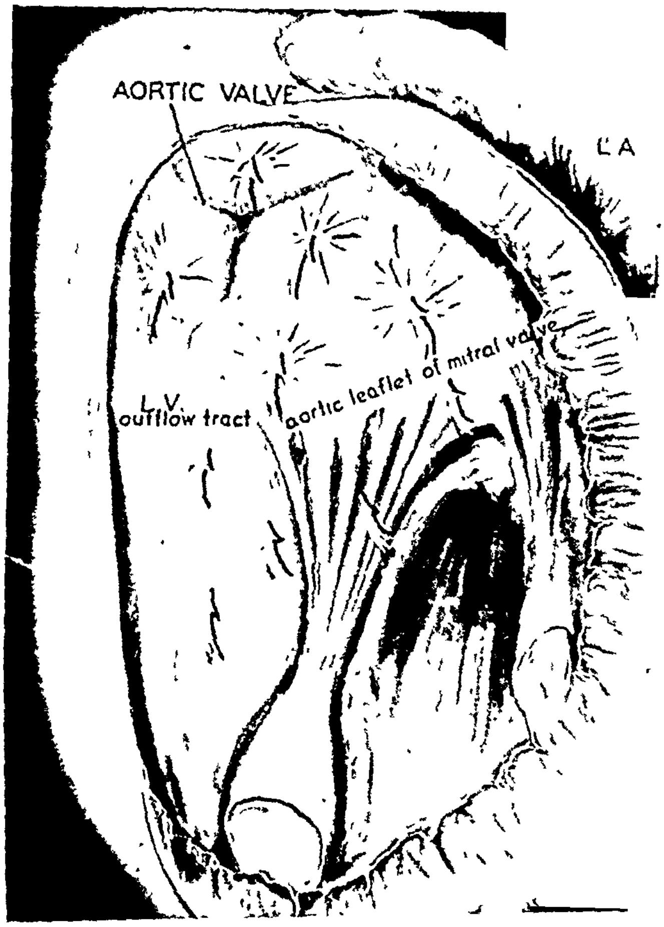


Fig. 1.—Interior of left ventricle indicating major areas of trauma from high flow pressure generated within left ventricular outflow tract.

Therefore, from the standpoint of pathology, surgical intervention in aortic stenosis, to effectively restore a measure of normal valve leaflet motion, must be carried out before extremes of the above-described process are reached. To wait longer merely compounds the likelihood of surgical failure, for, in consequence of the valvular change, the left ventricular myocardium hypertrophies in time to ultimately dilate and become incapable of effective action. As the left ventricle is the keystone of the heart and circulation, its failure predicates irremediable disaster. This, again, is in contrast to the findings in mitral stenosis, where, despite profound pathological and clinical changes, even to the point of prolonged congestive failure and invalidism, the left ventricle retains its indispensable function—actual, compensatory, and recuperative—almost to the end.

Physiologically, because of the jet-like ejection of relatively small amounts of blood with each left ventricular contraction, the systolic blood pressure may not reach high levels although it is perhaps sustained and maintained longer than usual. Diastolic pressures, however, remain high so that the pulse pressure is small and coronary artery filling, now under greater stress because of the demands of an increased myocardial mass, may be inadequate. As such, these patients are often precarious anesthetic risks, to say nothing of the superimposed danger of surgery.

Anatomically, the valve is the least accessible to safe and easy exploration, for it lies centrally placed within the confines of the heart. The left ventricular myocardium is invariably hypertrophied to a considerable degree. This finding together with the tremendous vascular pressure generated within its outflow tract prevents the use of an immediately subaortic transmyocardial incision for the insertion of the finger or instrument, similar to that used in pulmonary valvotomy, because uncontrollable hemorrhage will surely follow. This necessitates a transmyocardial approach at some distance to the valve near the apex of the ventricle. The valve cannot be effectively reached through an auricular appendage. The position of the ostia of the coronary vessels lying directly behind the valve leaflets makes direct reconstructive surgery hazardous. An approach from above directly through the aortic wall presents the same difficulties encountered in the immediate subaortic transmyocardial approach and is time consuming. Thus, definitive technical access to the valve is awkward and far from ideal, regardless of the approach used.

To recapitulate, therefore, as a result of these concomitant changes, the ultimate prognosis in a given case of aortic stenosis, almost invariably calcified and immobile, lies purely in the integrity of the left ventricular myocardium. This chamber attempts valiantly to maintain adequate systemic circulation. Myocardial work is required to impart velocity to a necessary volume of blood. As the valve area diminishes, increased propulsive pressures accompanying left ventricular hypertrophy are clinically manifested by forceful heart action and heart consciousness. Added demands for increased cardiac output are thwarted by the unyielding valve, and fatigue and palpitation develop. The left ventricular pressure rises in an attempt to overcome the obstruction; a systolic pressure of 400 mm. Hg represents the extreme in the experience of one of us (R. P. G.).

Once a critical valve area is reached (approximately 0.7 sq. cm., according to Gorlin[1]), the heart is unable to maintain an adequate output. Dizziness, syncope, dyspnea, and angina—with or without the specific changes of coronary arterial disease—become evident. The left ventricle under these circumstances must ultimately fail, and when this occurs disaster follows in its wake. Pulmonary congestion and edema, right heart failure, and the ever-present threat of sudden death are the consequences of this uncompensated phase of aortic stenosis. Once this stage of diminished cardiac output with failure of the left ventricular myocardium is reached, the prognosis becomes grave, and as a rule patients in this predicament have but a matter of months to live.

Clinical Classification of Aortic Stenosis

The necessity for translating this inexorable chain of events into a reasonable, practical, clinical classification as a basis for intelligent medical management and surgical intervention is obvious. The course through which the average patient with aortic stenosis will pass is readily recognizable, although perhaps not clearly defined in the mind of the physician in the light of surgical advances. For a number of years one of us (R. P. G.) has used a system of clinical staging so that when the afflicted patient presents himself for evaluation some estimation of the patient's status in relation to the timing of surgical intervention can be made.[2] In this way it is almost immediately possible, within reason, to recognize where the patient may be, chronologically, in the over-all course of his disease syndrome. To be sure, this and all other classifications are deficient or oversimplified in the strict academic sense but by and large will be found most practical if carefully applied.

Stage 1 is that period during which the typical systolic murmur of aortic stenosis is present but before subjective symptoms of any kind have resulted. Stage 2 marks the onset of an ill-defined period in which the patient becomes subjectively aware of his forceful heart action, palpitations develop, and easy fatigue becomes noticeable. Admittedly, this stage is not specifically characteristic of aortic stenosis per se, but when seen in the patient whose cardiac pathology is that of aortic stenosis, the combination of the valvular pathology and symptoms takes on added significance. It is an indication that the myocardium is beginning to feel the effects of an unyielding obstruction at the aortic valve level. Stage 3 ushers in the obvious period of progressive disability due to a diminishingly effective cardiac output, evidenced cerebrally by spells of dizziness and syncope or myocardially by substernal discomfort, tightness, and effort-angina indicative of an inadequate coronary flow. Dyspnea without decompensation may be prominent.

With beginning left ventricular failure, stage 4 is characterized by episodes of pulmonary congestion and edema, at first rather easily controlled by medical measures but shortly to become refractory to even the most vigorous therapy. Stage 5 connotes impending disaster and an early death, for, in addition to left ventricular failure, superimposed right heart failure with hepatomegaly, ascites, and peripheral edema now labels the heart picture as one of irretrievable failure not to be reversed for long by any regimen, medical or surgical.

With such a progression of easily recognizable clinical findings, it becomes obvious that if surgery is to be of any real benefit it must be performed at a time when the myocardial integrity of the left ventricle is still intact. Ideally, therefore, the patient in stage 2 would represent the best such candidate, for the mortality will be low and the functional result in terms of myocardial efficiency high. Certain it is that the patient should not be allowed to go beyond stage 3, for as a rule even at this relatively late hour the myocardium has not failed. Not infrequently, the patient presents himself to his physician for the first time with symptoms of dizziness, dyspnea, or substernal distress, any previous symptoms having been either mild or ignored. Such a patient is already far advanced pathophysiologically in the course of his disease and preparations for surgical intervention should be made without further prolonged observation and delay.

More often than has heretofore been appreciated. sudden death may occur at this stage even before signs of cardiac decompensation have developed. This has been observed time and again not only in acquired aortic stenosis but in children under 15 years of age suffering from the congenital form of aortic stenosis. Once compensation of the left ventricle has been broken, the mortality resulting from surgery, whatever the technique, cannot fail to rise and the ultimate clinical result is reduced. Improved surgical techniques in very recent years have resulted in considerable salvage of patients in stage 4 and even occasionally in 5, but resort to surgery at this late date is like closing the barn door after the horse has been stolen. These facts will become more obvious with careful study of the clinical data from our own personal experience to be presented below.

Surgical Approach

Since 1913[3] surgeons have sought the ideal approach to the stenotic aortic valve. These attempts have included invagination of the aortic wall, retrograde split-dilatation through the right carotid artery, transventricular split-dilatation, direct manipulation through an aortic incision immediately above the valve, total bypass of the valve, and direct vision reconstruction with use of hypothermia or an extracorporeal circulation. For practical purposes, however, only three methods have been widely exploited—transaortic, direct vision by open heart methods, and transventricular. The first two permit actual palpation or visualization of the valve. On the mechanical drawing board or in the mind's eye, at least, the second of these methods would seem to be the only logical approach, for without question direct observation of the valve to be reconstructed should be better than any indirect, relatively blind approach.

Were the nature of the valve tissues in acquired aortic stenosis more benign in their distortion, free from calcium, or at least retaining some semblance of their normal, pliable, anatomic structure there would be no question that direct and open methods should be routinely employed. Unfortunately the pathology is such that direct vision is of diminished value, since the changes in aortic stenosis—destruction of landmarks, obliteration of commissures, replacement of valve elements by calcium, almost complete loss of pliability by involvement of the aortic ring, and even adjacent myocardium—render the valve incapable of functional restoration and reconstruction in the usual sense. Such a conglomeration of indurated gristle and calcium needs total excision, and when the valve can be successfully replaced in toto by a suitable prosthesis, then and only then will a satisfactory solution be approached (fig. 2).

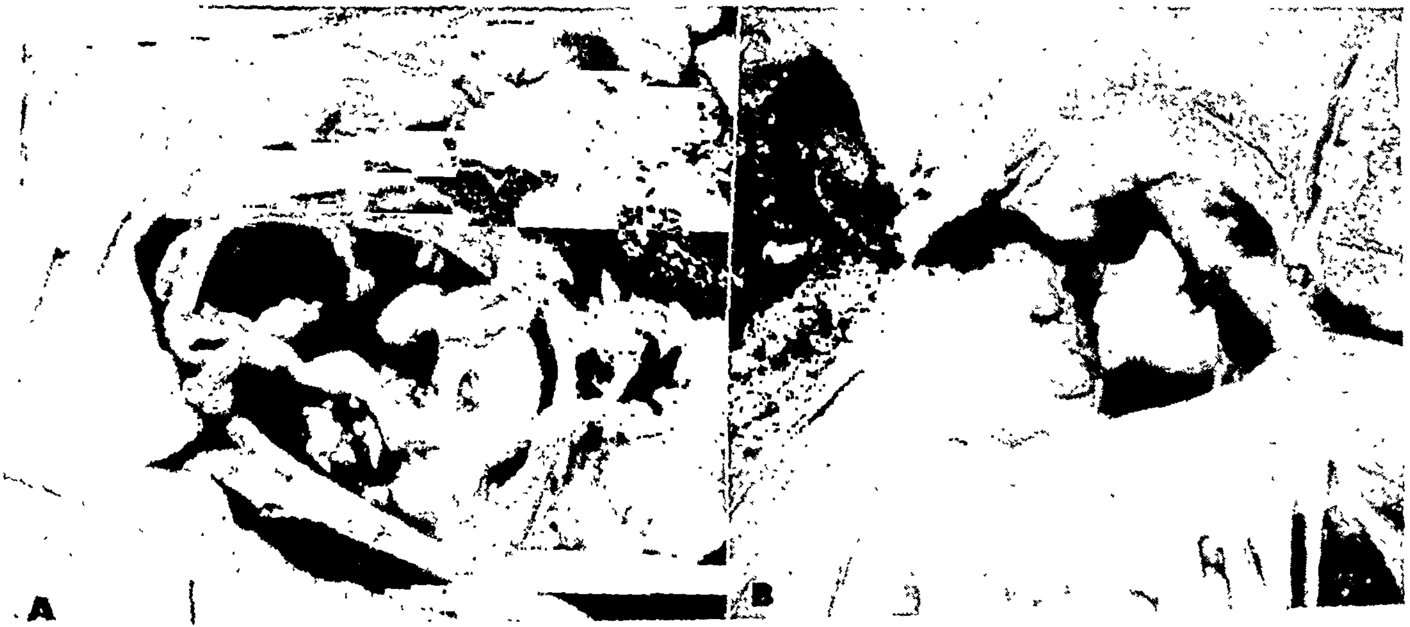


Fig. 2.—Calcific aortic stenosis viewed from aorta (*A*) and ventricle (*B*). Note complete destruction and replacement of pliable valve tissues by indurated fibrin deposition and calcium.

To be sure, an occasional valve partially stenosed by acquired disease may be encountered which will respond to mobilization and definitive commissural separation under direct vision, but they are so few and far between in the aggregate as to make this approach as a routine impractical except possibly for the early congenital forms of the disease. To date, therefore, to avoid the prohibitive mortality presently resulting from open techniques which, even if the patient survives, result in no better a functional state than can be obtained by far safer means, we have steadfastly and continuously utilized the transventricular approach which, with present refinements, yields results (admittedly palliative but the best obtainable under conditions of pathology encountered) very acceptable in mortality, morbidity, and ultimate clinical function.

A small, two-bladed dilator, no larger in caliber than a lead pencil, is advanced through a 1-cm. incision made in an avascular area of the left ventricle near its apex up into and through the aortic orifice. The position of the dilator within the valve is manually checked from the outside of the aorta. The dilator is opened in two or three planes and at one or two levels. One or two commissures (rarely three) despite the intensity of their deformity are routinely split open. Surprisingly enough, cardiac arrhythmias and hemorrhage are rarely encountered. The procedure is done quickly, under complete hemodynamic control with pressures taken in the left ventricle and aorta before and after manipulation to assure maximum reduction of the valvular block. Since the instrument is well tolerated, the dilatation can be performed with deliberation and repeated two or three times if necessary. It is obviously impossible to completely abolish the valvular obstruction routinely because of the physical presence of rigidity and calcium, whatever the technique, but by this method initial gradients across the valve can be reduced to one-third their preoperative level, and many result in a gradient of less than 10 mm. Hg (fig. 3).

Transventricular Approach to Aortic Stenosis

A consecutive series of 78 cases is presented, representing the two phases of transventricular commissurotomy techniques through which we have passed. This series was begun in March, 1951, and for purposes of this presentation includes every patient operated on through June, 1957. Ages ranged from 4 to 57 years. In 24 patients, combined mitral and aortic commissurotomies were performed. In one instance an associated complete coarctation of the aorta was resected with end-to-end anastomosis after which aortic commissurotomy was accomplished. The majority of these operations were carried out in patients in the far-advanced stages (4 and 5) of their disease. Seventy of the 78 patients had moderate to marked calcification of the aortic valve. Thirteen were in permanent atrial fibrillation. (Ten of these presented both mitral and aortic stenosis.)

The first 37 patients in this series were operated on by the old original technique reported in 1952,[4] with use of a large three-bladed expandable split-dilator (Larzelere-Donaldson design) inserted through a widely purse-stringed area near the apex of the left ventricle. This method has long since been abandoned because of the unwieldiness of the instrument, the unnecessary myocardial trauma, and arrhythmias, and the excessive blood loss which it incurred. These early experiences rightly indicted the ventricular approach by this technique, but the error was in the technique, not the approach, as will be shown. During this period of time an additional 100 patients with either pure stenosis or combined valvular disease were turned down for aortic commissurotomy because of the obvious dissatisfaction with the technique being used as well as the advanced nature of the disease encountered. A recent check reveals that all of these patients who were refused surgery have long since died from the disease.

The remaining 41 patients, operated on since June, 1955, were operated on by a greatly refined transventricular technique using the method and dilator (Brock) briefly described above. The two series are as different in performance and results as night is from day.

Mortality

It is our firm conviction that until the aortic valve can be replaced the transventricular approach, properly used, *is safer and is as effective a method* for the relief of aortic stenosis as is available today.

As yet no appreciable series of extracorporeal methods for the relief of acquired aortic stenosis have appeared in the literature, but in a few small series reported the mortality rate has ranged from 50 to 100%. This obviously represents a developmental phase which should be short-lived once adequate valvular replacement becomes possible. In the recent past, Bailey[5] has reported an operative mortality of 15.1% using the aortic approach to the valve. On the other hand, Brock's success with the transventricular route has been very impressive. His over-all operative mortality has been 16%, but in his most recent 63 reported cases, there were but four deaths, an extremely acceptable 6% mortality.[6]

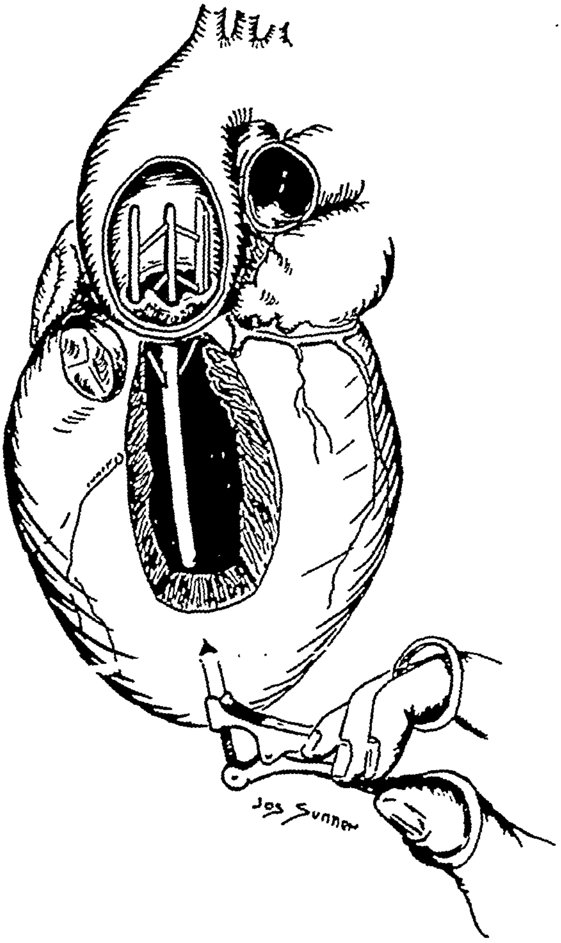


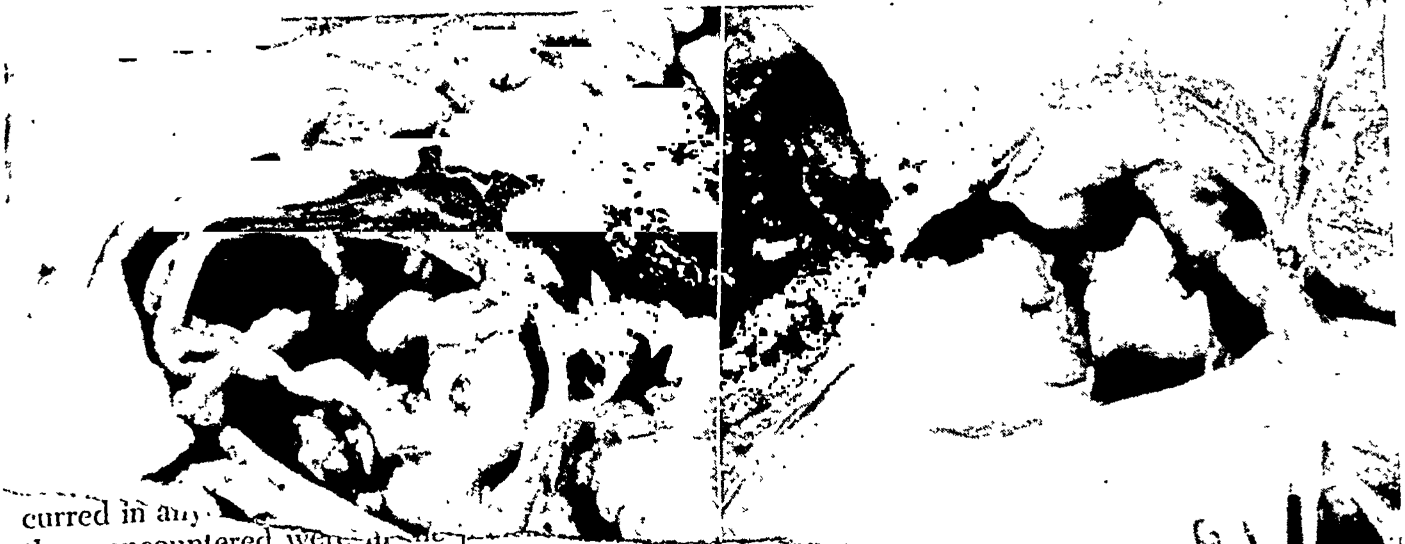
Fig. 3.—Transventricular approach to aortic stenosis through 1-cm. avascular incision in area near apex of left ventricle. Instrument, no larger than lead pencil, is atraumatic and well tolerated. No hemostasis in myocardium is needed during operative procedure.

The deaths in this series of 78 patients are divided into two categories—operative deaths and late deaths. Operative deaths are those in patients who died in the hospital during or after surgery up to one month. Of the 37 patients operated on by the older obsolete technique, there were 17 deaths, a mortality of 46%, obviously intolerable. In the more recent group of 41 patients operated on by the presgrade split-dilatation through the right carotid artery, transventricular split-dilatation, direct manipulation through an aortic incision immediately above the valve, total bypass of the valve, and direct vision reconstruction with use of hypothermia or an extracorporeal circulation. For practical purposes, however, only three methods have been widely exploited—transaortic, direct vision by open heart methods, and transventricular. The first two permit actual palpation or visualization of the valve. On the mechanical drawing board or in the mind's eye, at least, the second of these methods would seem to be the only logical approach, for without question direct observation of the valve to be reconstructed should be better than any indirect, relatively blind approach.

Were the nature of the valve tissues in acquired aortic stenosis more benign in their distortion, free from calcium, or at least retaining some semblance of their normal, pliable, anatomic structure there

missural separation under direct vision, but they are so few and far between in the aggregate as to make this approach as a routine impractical except possibly for the early congenital forms of the disease. To date, therefore, to avoid the prohibitive mortality presently resulting from open techniques which, even if the patient survives, result in no better a functional state than can be obtained by far safer means, we have steadfastly and continuously utilized the transventricular approach which, with present refinements, yields results (admittedly palliative but the best obtainable under conditions of pathology encountered) very acceptable in mortality, morbidity, and ultimate clinical function.

A small, two-bladed dilator, no larger in caliber than a lead pencil, is advanced through a 1-cm. incision made in an avascular area of the left ventricle near its apex up into and through the aortic orifice. The position of the dilator within the valve



curred in any [illegible] three encountered were [illegible] bined aortic and mitral commissurotomies, one of whom died, the other two recovering nicely. No form of carotid compression or occlusion has ever been used.

In the entire series 15 patients have died since leaving the hospital (1 to 41 months after surgery). Eight of these late deaths occurred in patients who had been subjected to the old operative technique; seven deaths were in the group who underwent the new operative technique. These data are presented in table 1. It should be added that one of the patients who died at a late date after surgery did not die from his cardiac disease per se for he committed suicide. This was strange because this patient had obtained a good functional result but lived in fear and dread of his disease potential.

Autopsies were obtained in 16 instances (early and late), and in each the aortic valve had been almost completely replaced by calcium. Coronary occlusion was demonstrated in two of the late deaths. The coronary arteries were patent in the remaining, although some evidence of atherosclerosis was observed as a rule.

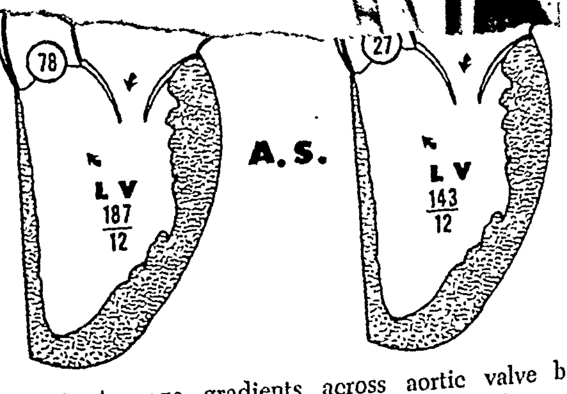


Fig. 4.—Average gradients across aortic valve before (*left*) and after (*right*) transventricular aortic commissurotomy.

(The patient having only an 8-mm. gradient was operated on mistakenly, for, although her studies and symptoms were characteristic of aortic stenosis, at operation she proved to be suffering from idiopathic hypertrophy of the left ventricle without valvular component.) Immediate postcommissurotomy aortic valve gradients ranged from 0 to 75 mm. Hg, averaging 27 (fig. 4). It is quite probable that, with the passage of a little time for myocardial readjustment, these gradients might now be considerably less.

A slightly greater hemodynamic change occurred in the patients who as yet had not gone into failure prior to surgery. Of 19 patients in stage 2 or 3 having operative pressure studies, the left ventricle-aortic systolic gradients averaged 83 mm. Hg before and 29 after commissurotomy, a reduction of 54 mm. Hg, obviously of marked significance. The average systolic gradient in 24 patients in stages 4 and 5 (after left ventricular failure) dropped from 70 to 28 mm. Hg after commissurotomy (a 42-mm. reduction).

It is obvious that complete abolition of the valvular gradient rarely ensues for reasons considered above—namely, the nature of the pathology (fig. 5). These hemodynamic results are a decided improvement over those which have been published (very few reported) by all other aortic valvular approaches.

Clinical Results

The present status of those patients living has been ascertained either by personal examination or from specific reports from their referring physicians. Twelve of the 37 patients operated on by the older technique are living to this day (three to seven years), and all are distinctly improved. Their ability to work, walk, and indulge in mild exercise is better than it had been at any time during the years immediately preceding surgery, so that for them the operation was worthwhile. One patient has occasional dyspnea on exertion, and another takes nitroglycerin tablets infrequently for chest pain but otherwise remains improved.

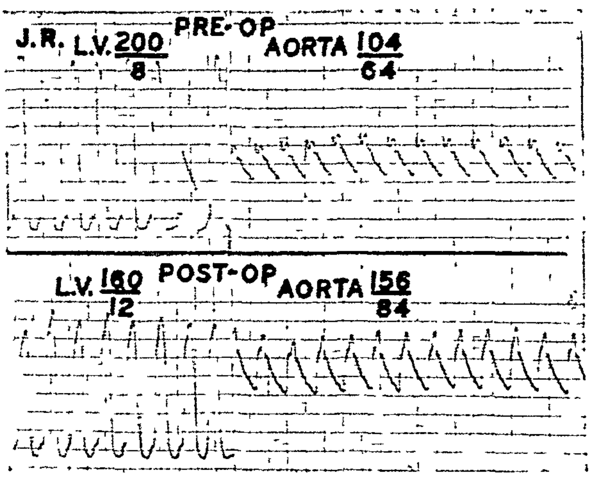


Fig. 5.—Pressure tracings illustrating gradient across aortic valve before and after aortic commissurotomy. In this instance left ventricular pressure is lower and aortic pressure higher, indicating highly satisfactory result.

Data on 33 of the 41 patients operated on by the new technique (June 1, 1955 to June 1, 1957) have been analyzed, there being a reasonable length of observation of a year or more for analysis. Twenty-five of these are alive, and 22 are very definitely improved. They have shown definite symptomatic improvement, and in them surgery has been of benefit. To be sure, these patients realize that they do not have new hearts or new valves, but they are now living with their diseased condition in an improved state. None of this group has shown signs or symptoms of aortic insufficiency. Nineteen of them have returned to various degrees of work, ranging from housework to welding. The incidence of syncope, dizziness, shortness of breath, chest pain, orthopnea, and recurrent congestive failure has been uniformly diminished, in most incidents abolished. Thus, 22 (67%) of the 33 patients operated on in this newer group have been materially helped by surgery. The remaining 8 patients of the new group of 41 are all living and improved within the first year; but not enough time has elapsed to include them in the larger group of later results.

TABLE 2.—*Long-Term Results After Aortic Commissurotomy*

Stage No	Cases, No	Survival Period, No.	Present Status
	Old Technique		
2	2	32 & 57	Improved
3	4	38 to 63	Improved, 2 Excellent, 2
4	4	37 to 64	Improved
5	2	47 & 65	Improved
	New Technique		
2	1	16	Excellent
3	13	8 to 31	Excellent, 5 Improved, 7 Unimproved, 1
4	9	9 to 22	Excellent, 3 Improved, 5 Unimproved, 1
5	2	10 to 27	Improved

Three of the patients in the newer group have not been benefited, although they are still alive. One is the patient operated on under an erroneous diagnosis which proved at operation to be that of idiopathic hypertrophy of the left ventricle without valvular involvement. Another patient, although able to work intermittently, is orthopneic, has angina and dizziness, and is unable to climb stairs. The third patient, while improved from the cardiac standpoint, is still recuperating from an operative cerebral embolus (table 2).

Comment

It is felt that the technique with use of the transventricular route is the best possible form of surgical palliation for aortic stenosis at the present time and until, by open-heart methods, the valve can be replaced. When one realizes the pathology with which the surgeon must cope and that the hemodynamic changes resulting from this pathology are inexorable and follow a rather set pattern, it must be obvious that the only way to improve these results is by earlier selection of patients for surgery. Because in recent years most physicians have had considerably more experience with the problems of mitral stenosis than they have had with those of aortic stenosis, it would appear that much confusion exists as to what constitutes the proper indication for surgery in aortic stenosis. Patients are being referred for aortic stenosis surgery on the basis of indications of mitral stenosis. This practice must terminate, for the two disease conditions present major differences. The difference lies in the status of the left ventricular myocardium and the effects which these two valvular conditions exert on the integrity of this structure. The left ventricle is the keystone of the heart. Despite numerous and repeated bouts of pulmonary edema and right ventricular failure, the left ventricle in mitral stenosis has been spared and remains as a strong and effective chamber. Actually, valvular obstruction at the mitral level has provided a measure of protection. It follows then that decompensation in mitral stenosis is essentially right heart failure and not left.

With the establishment of more normal mitral valvular mechanics by surgery, the left ventricle can resume its fundamental role of maintaining total circulation effectively. Thus, if one must wait in mitral stenosis for numerous bouts of congestive failure to occur (not recommended), these patients may still be salvaged to a high degree, mainly because of the highly effective action of the left ventricular myocardium. This pattern has pervaded the physician's thinking and has acted as a model for the reference of all valvular patients for surgery. The delay and wait for the signs and symptoms of decompensation is the greatest single factor accounting for the poorer results obtained in the surgery of aortic stenosis.

It must be realized and repeatedly emphasized that from the very beginnings of aortic stenosis the brunt of the obstructive effect is absorbed by the left ventricle itself. It follows, therefore, that when the patient with aortic stenosis shows signs of decompensation his cardiac failure means left ventricular failure. One cannot wait in aortic stenosis until pulmonary congestion or frank congestive failure has developed, for myocardial reserve will then be all but gone. This distinct difference between the effect of mitral stenosis and aortic stenosis must be appreciated to the fullest before patients suffering from the latter condition will receive their best possible chance for survival and improvement. One has only to appreciate the fact that 17 of the 19 operative deaths in this series were in patients who had already experienced left ventricular failure to comprehend that new and realistic criteria must be established if these people are to be given a fighting chance. Furthermore, once surgery has been performed, these patients must not be sent out into the world to fend for themselves, medically speaking. They need careful medical advice and management indefinitely for the future. Even in those patients who have obtained the best hemodynamic response at the time of surgery, one must appreciate the fact that the left ventricle for years has been taxed to its uttermost and now needs intelligent careful support for its remaining lifetime.

To recapitulate then: When the nature of the pathology in aortic stenosis is fully appreciated, when the physiological and myocardial effects of this pathology are recognized, when the patient is referred for surgery prior to left ventricular failure, and when surgery is performed by a swift and simple technique, then, and only then, will patients suffering from this most difficult of all stenotic valvular lesions be given their best chance for survival and maximal functional improvement.

Conclusions

Acquired aortic stenosis is more resistant to medical or surgical treatment than any of the other stenotic valvular lesions, by virtue of its inherent pathological and physiological derangement. There is a practical and workable classification for the recognition of this disease complex. For the lowest mortality and the best functional results, surgery must be performed before cardiac decompensation (in this instance left ventricular failure) has occurred.

Transventricular aortic commissurotomy by present-day improved techniques carries a minimal mortality (5%) and provides functional improvement in approximately 70% of patients properly selected and referred for surgery before the myocardium of the left ventricle has failed. The ultimate surgical objective is to replace the diseased aortic valve by a suitable prosthesis, with use of open, direct vision techniques. That day has not arrived, and until it does the patient will best be served by conservative, instrumental, split-dilatation methods.

269 S. 19th St. (Dr. Glover).

References

1. Gorlin, R., and others: Dynamics of Circulation in Aortic Valvular Disease, Am. J. Med. **18**:855-870 (June) 1955.

2. Glover, R. P.: Present Status of Surgery for Aortic Stenosis, Minnesota Med. **37**:167-170 (March) 1954.

3. Tuffier, T.: Etat actuel de la chirurgie intra thoracique, Tr. Internat. Cong. Med. **11**:249, 326, 1913-1914.

4. Glover, R. P.: Stenotic Valvular Disease of Heart: Surgical Treatment, Texas J. Med. **48**:674-685 (Oct.) 1952.

5. Bailey, C. P.: Recent Significant Developments in Intracardiac Surgery, Postgrad. Med. **20**:103-117 (Aug.) 1956.

6. Brock, R.: Surgical Treatment of Aortic Stenosis, Brit. M. J. **1**:1019-1028 (May 14) 1957.

FACTORS IN THE DECLINE OF MATERNAL MORTALITY

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Numerical data from the United States as a whole show a decline in the maternal death rate (per 10,000 live births) from 11.6 in 1946 to 4.0 in 1956. The figures for New York City and Bronx County show a comparable decline. A detailed study of the Bronx data has been made in order to identify the areas in which obstetrics has made its greatest advances and those on which attention should be concentrated in the future. Infection has shown the greatest reduction in maternal mortality rates, but it is still a leading cause of death because of the persistence of criminal abortion. There has been significant reduction in mortality from hemorrhage, heart disease, and anesthesia. The reduction of mortality from toxemia has been gradual over a period of many years, but further improvement must await the discovery of the cause of toxemia. Oxytocin therapy has facilitated the solution of some difficult obstetric problems, and cesarean section has displaced a number of dangerous manipulations. Improvements in the teaching of obstetrics, the control of labor, and the facilities in hospitals should lead to still further reduction of maternal mortality.

Obstetrics has shared fully in the advances made in medicine and surgery during the last 12 years. The marked reduction in maternal mortality during this period is sufficient evidence to substantiate this statement. Maternal death rates in the United States, in the city of New York, and in the county of the Bronx have shown a steady decline from 11.6 per 10,000 live births in the United States, 12 in the city of New York, and 16.3 in Bronx County in the year 1946 to 5 per 10,000 live births in the United States, 6 in the city of New York, and 7 in Bronx County for the year 1956 (table 1).

The figures for Bronx County are approximately 25% higher than those for the United States and for New York City. This is due to the fact that the *Maternal Welfare Committee of the Bronx County* Medical Society in computing the maternal mortality includes deaths from all causes whether they be direct, indirect, or nonrelated. The National Office of Vital Statistics of the United States and the Bureau of Records and Statistics, New York City Department of Health, are more selective.[1] They exclude such causes of deaths as anesthesia, cardiac disease, transfusion reactions, homologous serum jaundice, lower nephron nephrosis, and nonrelated diseases. The important fact, however, is the downward trend in maternal mortality in all these areas.

We feel that there are many specific factors responsible for this improvement. We were therefore interested to learn what they were and how they influenced the leading causes of maternal deaths. For this information the record of every woman dying in Bronx County between 1946 and 1957 was reviewed, providing she was pregnant or died within 90 days of the termination of such pregnancy, regardless of cause or method of termination. These deaths were divided into six-year study periods for the purpose of comparison. During this interval there were 254,249 live births and 303 maternal deaths.

Infection

Although infection accounted for only 10.2% of all maternal deaths, it showed the greatest reduction in maternal mortality during the past six years. The discovery of penicillin by Fleming about 15 years ago ushered in the era of antibiotics. Today, in addition to penicillin, there are wide-range antibiotics which enjoy immense popularity throughout the United States. With the availability of these drugs, there has occurred a marked decline in maternal mortality. Thus, in Bronx County, deaths from infection have decreased 80% during the second study period 1952-1957 (table 2). Were it not for the large number of deaths due to infection from criminal abortion (table 3), which often do not respond to the antibiotics, infection would be eliminated as a leading cause of maternal death.

The antibiotics have been used with success as a prophylaxis in patients with prolonged labor and in patients with premature rupture of the membranes. As an adjunct to the antibiotics, blood transfusions have also helped to reduce the number of deaths from infection. We must never forget that hemorrhage and infection go hand in hand; infection often ensues where hemorrhage has not been adequately treated or controlled.

Recent progress in obstetric physiology has led to new concepts in treatment of uterine inertia. The judicious use of a diluted intravenous drip of oxy-

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From the Bronx County Medical Society, Committee for Maternal Welfare.

tocin (Pitocin) in patients with uterine inertia, after careful elimination of fetopelvic disproportion, has decreased the incidence of long labors, difficult instrument deliveries, and the number of cesarean sections. Thus an important source of predisposing causes of infection has been eliminated.

The extended use of cesarean section of the lower uterine segment and the introduction of the extraperitoneal operation have lessened the risk of abdominal delivery. The reinforcement of the lower segment operation with antibiotics has created some doubt in many minds as to the importance of the latter type of operation. Because of the relative safety of cesarean section, the incidence has increased markedly. From 1943 to 1955 the proportion of deliveries by cesarean section rose by 70% in New York City.[2] D'Esopo[3] has shown that the increased incidence of cesarean section has resulted in less trauma to mother and baby without sacrifice of maternal lives.

TABLE 1.—*Maternal Death Rate per 10,000 Live Births for United States, New York City, and Bronx County*

Year	United States	New York City	Bronx County
1946	11.6	12	16.3
1947	11.3	11	15.4
1948	11.2	11	16.8
1949	8.0	8	14.7
1950	8.3	8	11.9
1951	7.5	6	11.4
1952	6.8	6	11.2
1953	6.1	6	9.3
1954	5.3	6	8.5
1955	5.0	6	8.0
1956	4.0	6	7.2
1957	...*	..*	11.0†

* Not available at time of study.
† Increase due to nonobstetric causes.

Anesthesia

In the past six years, anesthesia has become one of the most discussed problems in obstetrics. Spinal, epidural, and caudal, as well as local and general, anesthesia have become available to the obstetrician.

TABLE 2.—*Decrease in Maternal Mortality Among the Leading Causes of Maternal Deaths*

	Maternal Mortality per 10,000 Live Births		
Cause of Deaths	1946-1951	1952-1957	Decrease, %
Infection	1.5	0.3	80
Anesthesia	1.3	0.5	65
Toxemia	1.1	0.63	45
Hemorrhage	2.5	1.9	24
Heart disease	1.4	1.1	21

Each has definite indications and advantages, thus permitting a choice of various anesthetic agents. The progress in obstetric analgesia is linked with advances in pharmacology and new techniques in anesthesia.

Deaths from anesthesia in Bronx County were responsible for 8.2% of all maternal deaths. In the past six years, the maternal mortality from this cause has decreased 65% per 10,000 live births (table 2). The causes of anesthetic deaths are shown in figure 1. The greatest improvement was noted in spinal anesthesia. There were no deaths from spinal "shock" after 1952 (fig. 1). A lowered mortality was made possible by the combined efforts of the obstetrician and anesthetist. The former has developed a greater interest in this subject because of the demands made on him by his patients. He has become familiar with the indications as well as the dangers of the various agents used. Together with the anesthetist, he frequently discusses and decides which type of anesthetic is best for his patient. Each patient is therefore given individualized treatment. Pudendal and saddle block are common practice today whenever a patient requiring anesthesia has been admitted with a full stomach. Thus the dangers of general anesthesia have been lessened.

The number of qualified individuals who administer anesthesia has increased in Bronx County since 1946. These trained personnel not only are qualified in the mechanical phase of giving an anesthetic agent but also are capable of recognizing and coping with any of the complications arising therefrom. Many deaths from cardiac arrest have been averted by an alert anesthetist and a quick-acting surgeon. Unfortunately, there is still a shortage of trained anesthetists for "all-around-the-clock" anesthesia. The utilization of modern equipment and the availability of recovery rooms staffed with trained personnel have also played a prominent role in the reduction of maternal deaths from anesthesia.

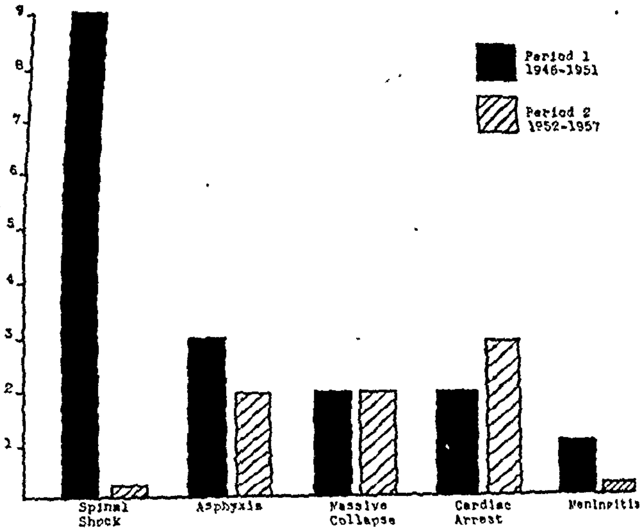

Fig. 1.—Causes of deaths due to anesthetics and comparison of mortality (period 1 with period 2).

Toxemia

Eastman[4] has shown that the maternal mortality from toxemia in the United States from 1935 to 1952 has decreased from 12.7 deaths per 10,000 live births to 2.3. Toxemia, which has accounted for 9.3% of all deaths in Bronx County, has shown a

43% decrease in mortality per 10,000 live births in the past six years (table 2). The greatest improvement was seen in eclampsia (table 3).

We believe this decline was due to several factors. Advances in renal physiology, biochemistry, and pharmacology have enabled us to change our concept of the toxemias and thus improve our therapy. We have gone a long way since the days when the Stroganoff method was the treatment of choice. We have come to look on the fundamental alterations in the physiology of eclamptogenic toxemia as arteriolar spasm and on the metabolic disturbances as progressive retention of sodium with resulting accumulation of tissue fluid.

As recently as 10 years ago, no reliable agent was available to combat vasoconstriction directly and effectively. Within the past few years, several effective hypotensive agents have become available and have been classified according to their site of action. Thus, we have the centrally acting agents, those which are autonomic blocking agents at the ganglionic level, those which affect the nerve endings at the neuromuscular junction, and finally the adrenolytic drugs which counteract the action of adrenal-like substances in the circulation.[5] Evidence points to the fact that no hypotensive drug whose site is at or below the ganglion will be effective in lowering the pressure elevation of pregnancy toxemias. Clinical reports throughout the United States seem to favor the use of a combination of these antihypertensive drugs, since they seem to counteract each other's side-effects while still showing their complementary action. These drugs have their greatest value in the prevention of hypertensive crisis and cerebrovascular accidents.

TABLE 3.–*Causes of Infection, of Toxemia, and of Deaths due to Heart Disease*

Cause	Period 1946-1951	 1952-1957
Infection		
Abortion	19	4
Puerperal	3	3
Puerperal, septic pulmonary emboli	1	0
Extrauterine	0	1
Total	23	8
Toxemia		
Preeclampsia	2	2
Eclampsia	14	8
Vascular disease with superimposed toxemia	1	1
Total	17	11
Deaths due to heart disease		
Rheumatic	15	12
Hypertensive cardiovascular	3	0
Arteriosclerotic	0	1
Kyphoscoliotic	0	1
Total	18	14

Recently, chlorothiazide (Diuril) has been added to our armamentarium of therapeutic agents and promises to be effective in the treatment of toxemia. This drug has a direct effect on the kidney tubules, blocking the reabsorption of water and of electrolytes. It thus has a potent diuretic action. Wilkins[6] also believes that it has a unique hypotensive action. Control measures for correction of metabolic disturbances have included restriction of sodium intake, ammonium chloride, cation exchange resins of the hydrogen cycle type, and carbonic anhydrase inhibitors. Finally, more intelligent prenatal care, better nutrition, correction of anemia, and the liberal use of magnesium sulfate for impending convulsive states have been effective in reducing toxemic mortality.

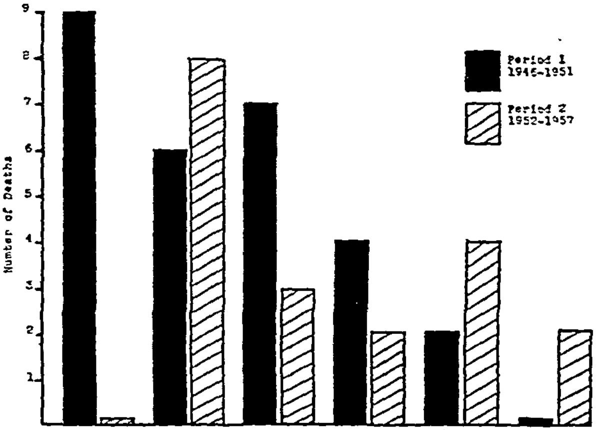

Fig. 2.–Causes of deaths from hemorrhage and comparison of mortality (period 1 with period 2).

Hemorrhage

The most frequent cause of maternal death was hemorrhage, which comprised about 19% of all deaths. During the period between 1952 and 1957, deaths from this cause decreased 24% per 10,000 live births in Bronx County (table 2). This decline was primarily due to the more liberal use of available blood.

The basic treatment of hemorrhage regardless of cause is the administration of blood. With the establishment of blood banks throughout the United States, blood transfusions have become the most common form of hemotherapy. The routine determination of the blood group, Rh factor, blood cell count, and hemoglobin level during the prenatal period has eliminated undue delay in the administration of blood when urgently needed.

Uterine atony, always a common cause of hemorrhagic death, declined more than 50% (fig. 2). Besides adequate blood replacement, the use of oxytocin given intravenously by drip method has often counteracted the uterine atony and thus helped to control blood loss.

Deaths from abruptio placentae have also decreased approximately 50%. This improvement was partly due to better understanding of the underlying pathology and the decrease in incidence of toxemia with which this is frequently associated.

Once again, the availability of an ample supply of blood has enabled the obstetrician to treat this condition conservatively. This type of treatment has yielded good results. However, where hemorrhage and shock are severe and the cervix is still canalized and unaffected, cesarean section after blood transfusion seems to be the more conservative and safe procedure.

Since placenta previa failed to show a decrease in maternal mortality, we must consider this a major obstetric problem. In our opinion, our death rate did not decline for three main reasons: (1) failure to perform cesarean section for the more dangerous type of placenta previa, (2) failure to use blood as a prophylactic against the effects of possible dangerous blood loss and also as a replacement for any great loss, and (3) failure to examine the patient in the operating room in preparing for immediate surgery.

Traumatic rupture of the uterus, the leading cause of death from hemorrhage during 1946-1951, was not encountered during the second study period (fig. 2). This achievement was made possible by the realization that high forceps and version and extraction were not without danger. They have yielded wisely to cesarean section.

Analysis of our deaths from ectopic hemorrhage shows an increase rather than a decrease in the past six years. Since 80% of these deaths occurred either at home or on the way to the hospital, or shortly after arrival, the fault must be either with the patient for not seeking earlier care or with the physician who failed to recognize this condition. We have reason to believe that the increase in mortality in our series was largely due to the occurrence of ectopic pregnancy in the indigent and patients in the low-income group who failed to seek early medical care.

Blood coagulation defects which were unrecognized before 1950 became evident during 1954-1955 (fig. 2). Acute afibrinogenemia has been reported ost frequently in instances of amniotic fluid emolus, long-standing intrauterine death, and abrupio placentae. The condition is now believed to be attributed to two possible causes: (1) the entrance of placental, pulmonary, or other thromboplastic substances in the circulation, thereby producing a diffuse precipitation of most of the plasma fibrinogen, leaving the blood thereafter incoagulable [7] and (2) the presence of fibrinolytic agents in the blood stream which prevent the formation of an adequate clot.[8] Unfortunately, under these circumstances, blood replacement alone may not be sufficient to combat hemorrhage effectively. The use of fibrinogen therefore becomes essential. In our study, one of the deaths was due to a delay in obtaining this substance. At present, fibrinogen is stored in the blood banks of most hospitals and such deaths are considered preventable. In line with obstetric progress, the "clot observation test" has become a routine procedure in all pregnant patients admitted to the hospital in whom the above-mentioned conditions are suspected. Also, determination of fibrinogen blood levels by the Schneider [9] method or other methods is important, not only to confirm fibrinogen deficiency but as a guide to therapy. As a result, we have had no deaths from this cause since 1955.

In conclusion, blood banks, transfusions, fibrinogen, intravenously given oxytocin, and intelligent use of cesarean section are some of the specific factors causing a decline in maternal mortality from hemorrhage.

Heart Disease

Jensen [10] states that in the United States about 1,000 maternal deaths from heart disease occur each year. It comprised about 10.6% of all our deaths. During the period 1952-1957 the mortality rate from this cause decreased about 21% per 10,000 live births over the previous six years (table 2). The causes of death from heart disease and their frequency of occurrence are shown in table 3.

Until recently, maternal salvage depended on the following therapy: early recognition of the complication; proper evaluation of the cardiac status; limitation of cardiac output by restriction of excessive physical activity, adequate bed rest (prenatal as well as postnatal), and restriction of sodium intake and excessive weight gain; administration of antibiotics and chemotherapy for intercurrent infection; correction of antepartum anemia; and early recognition and prompt treatment of cardiac failure with digitalis and diuretics. Of utmost importance is hospitalization as soon as failure is discovered. These patients must not be permitted to leave the hospital until after a somewhat longer postpartum period. During labor, sedation is indicated and delivery performed as soon as full dilatation is completed in order to eliminate the second stage. A local anesthetic is the anesthetic of choice. Therapeutic abortion is rapidly disappearing from the list of our therapeutic procedures.

The most dramatic results in the treatment of heart disease in recent years have been achieved by surgery.[11] Cardiac surgery has become practical due to newer diagnostic methods such as angiocardiography and cardiac catheterization. Advances in anesthesia together with the development of the cardioscope have increased the safety of such surgery.

Mitral stenosis complicating pregnancy has always had a grave prognosis. Through surgical means a select group of pregnant women with this malady can now be spared therapeutic abortion or complete bed rest throughout pregnancy. It is believed that the ideal time for surgery is before the patient becomes pregnant. However, Logan and Turner [12] as well as Cooley and Chapman [13] have reported successful results in patients who had surgery performed during the fourth month of gestation as an alternative to termination of pregnancy. Only with the passing of time and the accumulation of a large series of patients having had a thorough follow-up will we know the answer to the many questions now being asked about mitral commissurotomy in pregnancy.

General Considerations

The declining factors in maternal mortality mentioned thus far have been of a rather specific nature. There are, in addition, certain general factors that have played an important role in lowering our mortality: education, modern hospital facilities, and better obstetric control.

Education has served both the physician and the patient to great advantage. The better "brand" of obstetrics practiced today is an outgrowth of our modern educational system. Our residency program and the American Board of Obstetrics and Gynecology have laid the foundation for obstetrics as it is practiced today. Superimposed on this we have postgraduate instruction through maternal mortality conferences and scientific sessions sponsored by national organizations such as the American College of Obstetrics and Gynecology and the American Committee on Maternal Welfare. The various obstetric societies throughout the United States have also been a source of knowledge to the obstetrician. The sectional meetings of the American Medical Association and those of the various state medical societies have served the general practitioner as well as the specialist.

Through the newspapers and magazines, radio and television, the Red Cross, and maternity center classes, the lay public has become aware of the importance of seeking early prenatal care as well as good medical care. Many patients have thus become obstetric-minded and have sought competent care. Modern hospital facilities, better equipment, recovery rooms, and blood banks have enabled the patient to receive a higher standard of maternal care.

More rigid hospital rules and regulations pertaining to obstetric practice have been another safety device for the patient. Regulations pertaining to mandatory consultation for patients in labor 24 hours or more and for all first cesarean sections have increased the protection of the pregnant woman. The limiting of the performance of certain obstetric procedures and of the treatment of obstetric complications to qualified personnel only has resulted in superior practice of obstetrics.

Comment

Table 2 reveals that infection has shown the greatest reduction in maternal mortality rates. This is not surprising in view of the effectiveness of our current antibiotics. Criminal abortion is the only reason for infection still being considered as a leading cause of death.

Progress in obstetrics has not been without cost. Anaphylactic shock, severe dermatitis, and bacterial strains have resulted from injudicious use of penicillin. Likewise, the misuse and abuse of blood transfusions have caused many fatalities. Four such deaths were noted in our series. A rapid increase in blood volume is known to precipitate cardiac failure and pulmonary edema among patients with cardiac disease. Such an accident occurred in one of our patients with heart disease who received a transfusion rapidly. Blood was also given to a patient who developed "shock" after delivery without evidence of bleeding. Autopsy showed that death was due to a pulmonary embolus and not to hemorrhage. Deaths also followed errors in typing and cross-matching and the administration of the "wrong" bottle of blood. If we are to share in the benefits of transfusions and avoid its complications, we must have a greater respect for the indications and the preparations involved in the administration of blood. We feel that blood transfusions should be given by one trained in the laboratory procedures and clinical aspects of blood and its diseases. The obstetrician and anesthetist cannot and should not divert their attention from the patient for this purpose.

The reduction in maternal mortality from hemorrhage, toxemia, and heart disease has been gradual over a period of many years. The obstetrician has repeatedly emphasized their dangers and pitfalls. The improvement in anesthesia, however, has been more recent and more rapid. In 1953, we [14] reported an increase in number of deaths from anesthesia in Bronx County from 2% between 1940 and 1945 to 9% of the total mortality in the following six-year period. Since then there has been a decrease in mortality of 65% per 10,000 live births. Anesthesia, being the most recent leading cause of death, was somewhat neglected in the past. Even at the time of writing, the National Office of Vital Statistics of the United States and the Bureau of Records and Statistics, Department of Health, City of New York, do not list anesthesia among the causes of maternal deaths. As anesthesia came into its own as a specialty, numerous publications soon appeared in the literature and the importance of this subject came to the foreground. Simultaneously, studies by the various maternal mortality committees have also emphasized the complications of anesthesia that may occur in the pregnant patient. Thus the obstetrician has been alerted to its dangers. The combined efforts of both the obstetrician and the anesthetist have helped to reduce the number of deaths from this cause.

As for heart disease in pregnancy, since surgery concerns itself with a very small select group of patients only, the salvage of most pregnant patients with cardiac disease depends on nonsurgical measures. As Burwell [15] so wisely states, "The management of heart disease in pregnant women is seldom a problem of the use of digitalis or diuretics. It is a matter of the prevention and control of congestive phenomena by understanding and controlling the total burden of the heart."

Toxemia has shown a decrease in mortality even before the introduction of the antihypertensive drugs. This no doubt has been due to improved prenatal care and better understanding of the value of such care by the patient. The hypotensive drugs are not a panacea for all toxemias. Their greatest value at present is in preventing hypertensive crisis and cerebral accidents. Their use should therefore be limited to the severe type of toxemia rather than the mild or incipient variety.

Further improvement in mortality must await the discovery of the cause of toxemia. Until such time our only hope is a rational therapeutic approach based on the correction of disturbed physiology and metabolism, the control of convulsions, and the proper timing of termination of the pregnancy.

Summary

The past 12 years have been characterized by a period of phenomenal growth and accomplishments unmatched in the history of obstetrics. Blood banks have been a source of potential life to the patient and have given courage to the obstetrician. The antibiotics have become a formidable opponent of infection. Oxytocin (Pitocin) therapy has facilitated the problem of ruptured membranes, uterine inertia, induction of labor, and postpartum atony. The hypotensive drugs and newer diuretics have helped to control toxemia, and the anticoagulants have been the leading contender for the nonsurgical treatment of thromboembolic disease. Newer developments in anesthesia have given support to the surgeon in his search for improved technique. Cesarean section has displaced high forceps, version and extraction, and even "tough midforceps." Finally, education, better obstetric control, and improved hospital facilities have contributed liberally toward the marked reduction in our maternal mortality. Although many problems still remain unsolved, we look with great optimism toward the decade that now lies ahead for their solution.

1882 Grand Concourse (57) (Dr. Klein).

References

1. Bureau of Records and Statistics, Department of Health, New York City: personal communication to the authors.

2. Erhardt, C. L., and Gold, E. M.: Cesarean Section in New York City: Incidence and Mortality during 1954-1955, Obst. & Gynec. **11**:241-259 (March) 1958.

3. D'Esopo, D. A.: Review of Cesarean Section at Sloane Hospital for Women, Am. J. Obst. & Gynec. **59**:77-95 (Jan.) 1950.

4. Eastman, N. J.: Multi-Disciplinary Approach to Obstetrics, Bull. Maternal Welfare, pp. 16-22, May-June, 1957.

5. Cosgrove, S. A.: Management of Toxemia of Pregnancy, Bull. Margaret Hague Maternity Hosp. **9**:29-35 (Summer) 1956.

6. Wilkins, R. W.: New Drugs for Hypertension, with Special Reference to Chlorothiazide, New England J. Med. **257**:1026-1031 (Nov. 21) 1957.

7. Page, E. W.; Fulton, L. D.; and Glendening, M. B.: Cause of Blood Coagulation Defect Following Abruptio Placenta, Am. J. Obst. & Gynec. **61**:1116-1121 (May) 1951.

8. Ratnoff, O. D.: Studies on Proteolytic Enzyme in Human Plasma: VII. Fatal Hemorrhagic State Associated with Excessive Plasma Proteolytic Activity in Patient Undergoing Surgery for Carcinoma of Head of Pancreas, J. Clin. Invest. **31**:521-527 (May) 1952.

9. Schneider, C. L.: Rapid Estimation of Plasma Fibrinogen Concentration and Its Use as Guide to Therapy of Intravascular Defibrination, Am. J. Obst. & Gynec. **64**:141-147 (July) 1952.

10. Jensen, J.: The Heart in Pregnancy, St. Louis, C. V. Mosby Company, 1938, p. 133.

11. Schein, C. J., and Hurwitt, E. S.: Recent Advances in Surgery of Heart and Aorta, 1955, New York J. Med. **56**:524-537 (Feb. 15) 1956.

12. Logan, A., and Turner, R. W. D.: Mitral Valvulotomy in Pregnancy, Lancet **1**:1286 (June 28) 1952.

13. Cooley, D. A., and Chapman, D. W.: Mitral Commissurotomy During Pregnancy, J. A. M. A. **150**:1113-1114 (Nov. 15) 1952.

14. Klein, M. D.; Clahr, J.; Tamis, A. B.; and Solkow, M.: Maternal Deaths Caused by Anesthesia in Borough of Bronx from 1940 to 1951, New York J. Med. **53**:2861-2866 (Dec. 1) 1953.

15. Burwell, C. S.: Special Problem of Rheumatic Heart Disease in Pregnant Women, J. A. M. A. **166**:153-158 (Jan. 11) 1958.

NONSPECIFIC URETHRITIS.—The disease, or group of diseases, known as non-specific urethritis . . . is very common and appears to be increasing in incidence. In spite of much investigation, its cause is still unknown. The evidence for the view that it is a venereal disease is strong, but by no means conclusive. Final proof will depend upon discovery of the causative agent. Clinical and epidemiological histories obtained from 200 cases of non-specific urethritis were compared with similar data from an equal number of cases of gonorrhea. It was confirmed that in many ways the two diseases behave very differently. In particular the relationship between extramarital sexual exposure and onset of the disease was less definite among patients with non-specific urethritis. There was no evidence that the use of alcohol, locally applied chemicals, or contraceptives, or the previous administration of antibiotics played any part in the aetiology of the disease.—J. T. Boyd, G. W. Csonka, and J. K. Oates, Epidemiology of Non-specific Urethritis, *British Journal of Venereal Diseases,* March, 1958.

CYTOLOGICAL SCREENING FOR UTERINE CANCER THROUGH PHYSICIANS' OFFICES

REPORT OF 65,163 WOMEN EXAMINED OVER A PERIOD OF TEN YEARS (1947-1956)

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and
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If the cytological screening test is to be used for the detection of cancer in apparently normal persons, a thorough understanding of the significance of the in situ lesion is imperative. The experiences with large unselected populations and with rescreenings in women having a previous negative smear indicate a preponderance of carcinoma in situ. Reporting as an atypical finding the presence of normal glandular cells in smears of postmenopausal women may be of assistance in the detecting of adenocarcinoma of the endometrium. False-positive reports, if measured by negative biopsy diagnosis, were at most 9.3%. By use of a complete kit sent directly to the physician it is also feasible to reach a large rural population solely on a "mail-order" basis. A notable advantage of this system is the lack of infringement on the "doctor-patient" relationship.

The value of the cytological technique in the early detection of uterine cancer needs no confirmation.[1] However, as often happens when a more sensitive test of disease is uncovered, new challenges confront the medical profession.

The increased opportunity to discover in situ carcinoma of the cervix in asymptomatic women of the reproductive age group has brought urgent *need for better characterization of the relationship* of this lesion to invasive cancer. Another problem to be solved is how to extend the necessary facilities to make this procedure readily available to all adult women, particularly those residing in areas removed from the larger medical centers.

It is the purpose of this paper to report the findings for 65,163 women whose vaginal smears were examined at the Wisconsin State Laboratory of Hygiene over a period of 10 years (1947-1956), with special emphasis on the above-mentioned problems. It is also hoped that this study will serve as a base line for comparison with subsequent work of this nature in this geographical area.

Materials and Methods

Upon request, the State Laboratory of Hygiene provides for any physician, clinic, or hospital in Wisconsin complete kits with the necessary equipment to collect vaginal smears and return them by mail (fig. 1). Each kit is comprised of two telescoping cardboard mailing containers, a data sheet, a labeled screw-top jar containing 95% ethanol, two glass microscope slides, a 6-in. curved-tip glass pipet, and a suction bulb. Detailed instructions are included for the collection of a sample from the vaginal pool and one from the cervical os. Return postage is provided by the individual physician.

Smears were stained by the method of Papanicolaou[2] and examined by the cytology staff trained in this laboratory. All non-negative cases have been reviewed by at least two of us. Reports were sent directly to the referring physician. An "atypical" reading was accompanied by a request for repeat smears; "suspicious" or "positive" interpretations indicated that biopsy was required for definitive diagnosis. Tissue diagnoses were obtained from the pathologist to whom the biopsies were submitted and, whenever possible, also examined by one of us. Many tissue specimens were sent directly to our histopathology laboratory.

The total number of women in the state (exclusive of Milwaukee County), 20 years of age or older, varied from 785,000 to 832,000 for the period studied (table 1). Since the purpose of this service has been to reach rural areas devoid of local facilities, the acceptance of specimens from Milwaukee County and other areas where private cytology laboratories are operating has been discouraged. The investigative uterine cervical cancer study reported here includes patient information and cytological findings of the cytology program which originated several years earlier as a public service by the State Laboratory of Hygiene.

Findings

General Observations.—A progressive increase in total number of new women examined was observed, particularly in recent years (table 1). While this is further documentation of the increasing recognition of the value of this test, it also signifies

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From the State Laboratory of Hygiene and the Department of Medicine, University of Wisconsin Medical School, Madison, and the Field Investigations and Demonstrations Branch of the National Cancer Institute, Bethesda, Md.

that it is feasible to reach a large rural population solely on a "mail-order" basis. A notable advantage of this system is the lack of infringement on the "doctor-patient" relationship.

TABLE 1.—*Population Study, by Year, of Women in Wisconsin* Aged 20 Years or Older*

Year	Women, No.	Women Examined, No.	Average Age of 100 Randomly Selected Women	Confirmed Malignancies: Cases, No.	Confirmed Malignancies: Rate per 1,000 Women
1947......	785,000	21	..	1	47.6
1948......	791,000	521	43.73	16	30.7
1949......	800,000	1,851	44.55	58	31.3
1950......	807,000	2,576	44.26	44	17.2
1951......	811,000	3,198	44.56	52	16.3
1952......	815,000	4,673	43.18	71	15.2
1953......	820,000	7,310	44.41	89	12.2
1954......	824,000	9,302	43.98	122	13.1
1955......	828,000	14,720	43.23	143	9.7
1956......	832,000	21,011	41.41	209	9.9
Totals or ave	811,000	65,183	44.05	805	12.4

* Exclusive of Milwaukee County.

Figure 2 indicates diagrammatically the outcome of all the cases studied. It will be noted that the false-positive reports, if measured by negative biopsy diagnosis, were at most 9.3%. It is well recognized that single or even multiple punch biopsies may often not reveal samples of a microscopic lesion and hence fail to confirm a positive cytology report.

TABLE 2.—*Histological Classification of Neoplasms Encountered*

Type and Location	No.	Detected by Vaginal Smear: No	Detected by Vaginal Smear: %	Not Detected by Vaginal Smear (Known False-Negatives): No.	Not Detected by Vaginal Smear (Known False-Negatives): %
Epidermoid (squamous cell) carcinoma					
Cervix (in situ)......	206	195	94.7	11	5.3
Cervix (invasive)	335	323	96.4	12	3.6
Vagina (invasive)	5	4	...	1	...
Labia (invasive)	2	2	...	...	...
Adenocarcinoma					
Corpus	185	158	85.4	27	14.6
Cervix	28	26	92.9	2	7.1
Vagina	3	2	...	1	...
Ovary	2	2	...	...	...
Tubes	1	1	...	...	...
Adenoacanthoma	6	6	...	...	...
Coexistent tumors					
Adenocarcinoma, cervix and epidermoid carcinoma in situ, cervix	1	1	...	...	...
Adenocarcinoma, corpus and epidermoid carcinoma in situ, cervix	2	2	...	...	...
Anaplastic carcinoma					
Cervix	4	4	...	...	...
Corpus	1	1	...	...	...
Leiomyosarcoma	2	1	...	1	...
Mixed mesodermal tumors	2	2	...	...	...
Extrapelvic carcinoma, without observed pelvic metastases	2	2	...	...	...
Clinical diagnosis	18	18	...	...	...
Totals	805	750		55	

An estimate of the true number of false-negative reports cannot be made from these figures. However, a review of the histological classification of the neoplasms encountered reveals that proportionately a larger percentage of adenocarcinomas of the corpus were missed (table 2). The elusiveness of this tumor to cytological detection has frequently been reported.[3] It is of interest in this regard that approximately 25% of the histologically confirmed malignancies on both first and second screenings were adenocarcinomas of the endometrium. This is a higher number than has been reported by other centers.[4] Although selection may be partly responsible for this difference, particularly in the first screening, another reason worthy of consideration may be the interpretation given to normal glandular cells in smears of postmenopausal women. In this laboratory such a finding is reported as follows: "glandular cells normal in appearance but abnormal in presence are observed," and we recommend close follow-up with smears or curettage as indicated. This practice is in keeping with Papanicolaou's views[2] and has been responsible for correct diagnosis in many of our cases.

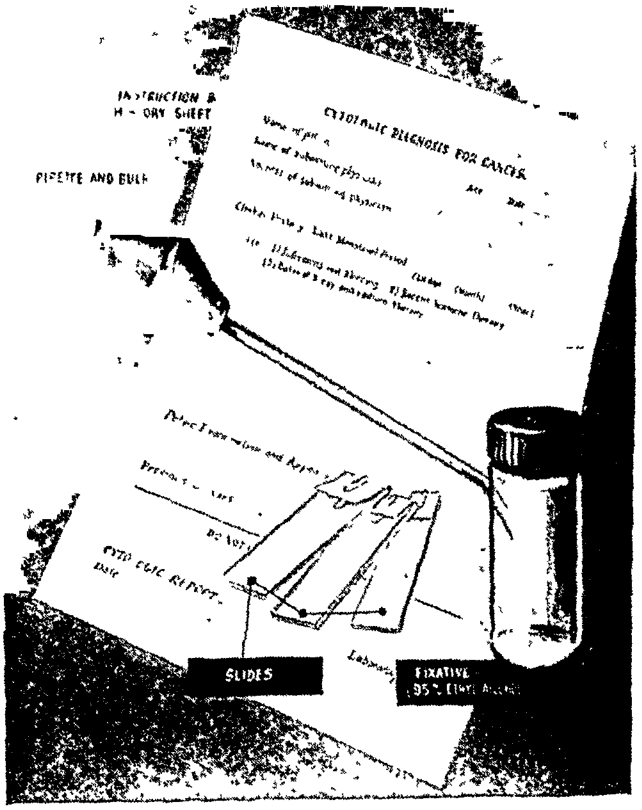
INSTRUCTION & HISTORY SHEET
PIPETTE AND BULB
CYTOLOGIC DIAGNOSIS FOR CANCER
SLIDES
FIXATIVE 95% ETHYL ALCOHOL

Fig. 1.—Equipment for collection of vaginal and cervical cytology smears. Double mailing tube, not shown here, is also included with each kit.

Figure 3 emphasizes the value of vaginal cytology in discovering carcinoma in situ of the cervix. Three-quarters of the confirmed cases of this lesion were not clinically detectable. The opposite relationship was evident for invasive cancer.

Histopathology Data.—It is customary in this as well as in other laboratories to confirm by tissue diagnosis all suspicious and positive cytological reports. This is good clinical practice and has been of value also in evaluating the reliability of the smear technique. Moreover, the number of biopsies performed represents an important index of interest and cooperation of the participating physicians. It is significant that, of 814 biopsies requested, in nearly 90% (726 cases) a tissue diagnosis was obtained. Reports on 2,448 unrequested biopsies were also received. In all, approximately 5% of the women studied are known to have had tissue examination. The histological classification of all the neoplasms reported appears in table 2. Abnormal or malignant cells were encountered in smears from a variety of genital neoplasms. In addition, malignant cells from two cases of intraperitoneal carcinoma without pelvic metastases presumably found their way into the fallopian tubes and were observed on the slides.

Prevalence Rates.–A progressive fall in yearly prevalence rates for all malignancies combined was observed (table 1). For the following reasons it appears reasonable to conclude that the observed decrease is an indication that more physicians in this state are using the test on asymptomatic women rather than on those with suspected lesions as in the earlier years. The total number of smears received has increased. The population involved is largely devoid of Negroes or Jews and, being predominantly rural, has tended to remain relatively stable. The average age of 100 randomly selected women per year has remained constant (table 1). First screenings only are included in these figures. Finally, personal communication with many of the physicians and the case histories accompanying the smears have confirmed this impression.

For epidermoid (squamous cell) carcinoma of the cervix only, our prevalence rate of 8.3 per 1,000 is higher than that reported by the investigators[4a] at Memphis in a population which included a large segment of Negroes. In a noncolored population this rate appears high as compared, for instance, to Nieburgs'[5] figure of 4.2 per 1,000 in 16,604 white women. Furthermore, a breakdown of our figures for in situ and invasive carcinoma (table 3) reveals a greater proportion of the latter. This is contrary to the experience of the other investigators who studied unselected populations. It seems likely, therefore, that a certain amount of selection was exercised by the physicians taking the smears. As noted above, this was more evident in the earlier years covered by this study. The reported rates for carcinoma in situ, however, are of the same order of magnitude in Memphis,[4a] Floyd County,[5] and Wisconsin. Because this is usually a microscopic, asymptomatic lesion, the effect of selection is small, and probably these figures represent reasonably accurate estimates of its prevalence in the populations studied.

Table 3.–*Comparison of Cervical Cancer Rates in First Two Screenings of Three Population Studies*

Study	Screening	Women, No.	Carcinoma in Situ No.	Carcinoma in Situ Rate/1,000	Invasive Cancer No.	Invasive Cancer Rate 1,000
Floyd County, Ga. (Nieburgs et al.[5])	First	17,761	56	3.9	28	1.6
	Second	4,482	12	2.7	4	0.9
Memphis-Shelby County, Tenn. (Erickson et al.[4])	First	108,136	393	3.6	331	3.1
	Second	32,728	72	2.2	9	0.3
Present study	First	65,163	206	3.2	335	5.1
	Second	9,111	10	1.1	4	0.4

Second Screenings.–A total of 9,111 women were rescreened after a period of not less than 10 months from the original negative examination. Smears leading to a positive tissue diagnosis were reported in 23 cases. Ten of these were carcinoma in situ and four were invasive epidermoid carcinomas of the cervix. The remaining nine cases were made up of six adenocarcinomas of the endometrium, two adenoacanthomas, and one ovarian carcinoma.

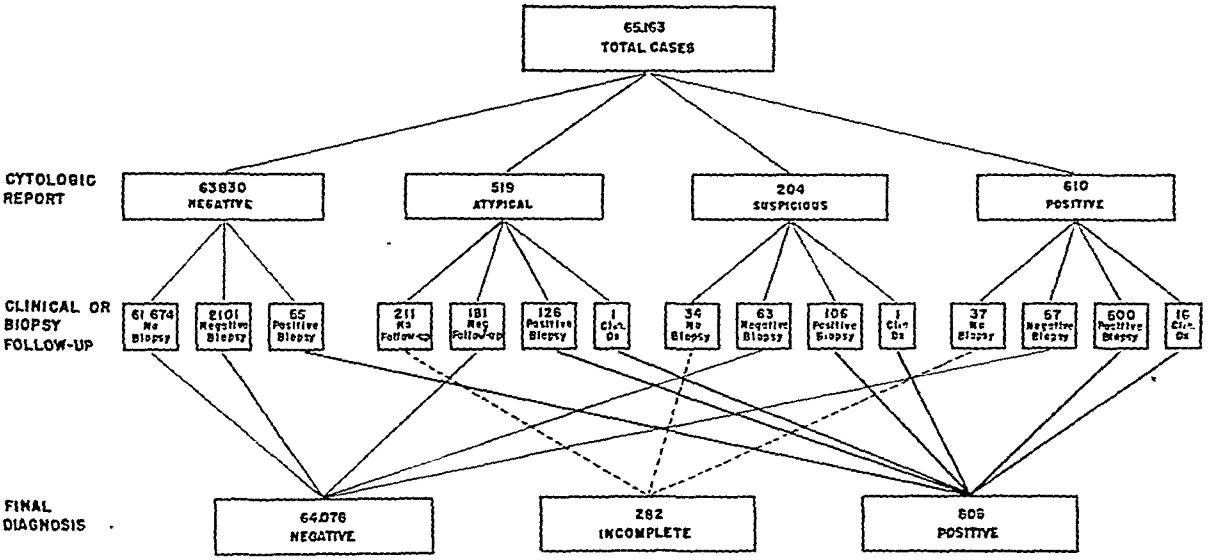

Fig. 2.–Present status of women studied. Cytological interpretation in all instances is on basis of first smear obtained.

It is recognized that these figures are probably too small to be statistically significant and that a determination of more accurate incidence rates must await adjustments for age and interval between screenings. Furthermore, the rates resulting from the second screening will usually *include a* smear indicate a similar preponderance of carcinoma in situ. It is evident that, if this test is to be employed for the detection of cancer in apparently normal individuals, a thorough understanding of the significance of the in situ lesion is imperative.

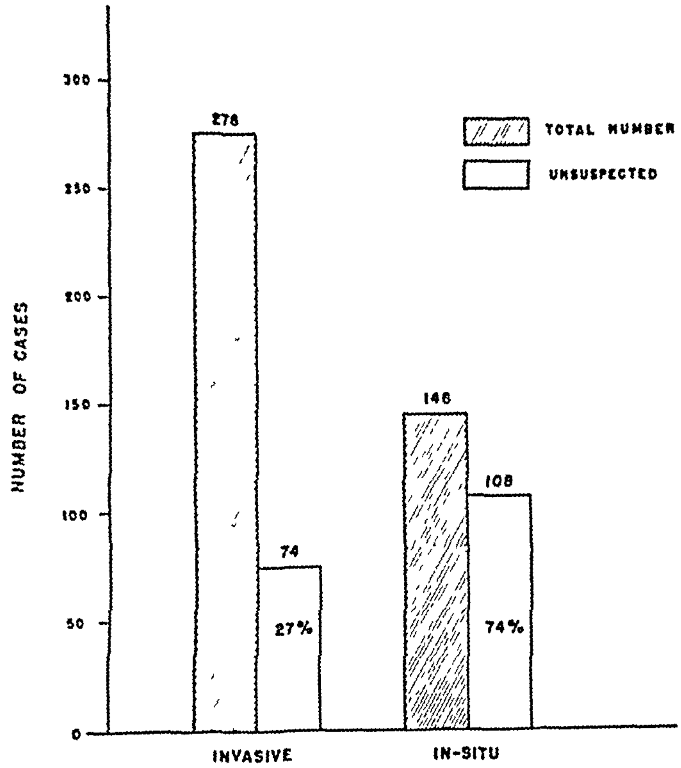

Fig. 3.—Value of vaginal cytology in revealing clinically undetectable squamous neoplasms of cervix. Only cases with adequate history are included.

In the study of the pathogenesis of cervical carcinoma in humans, the following two general approaches are being used: (1) the prospective[7] or retrospective[8] study of the lesion in the individual patient and (2) the study of the life history of the disease in a population by means of prevalence and incidence rates. A critical analysis of these approaches as well as a method for providing the necessary population data have been reported by Dunn.[9] The answers to this problem are not yet available. However, while still controversial, a strong case can be made for the acceptance of intraepithelial carcinoma as a stage in the development of invasive cancer of the cervix.[10]

The respective age distributions of rates observed for patients with these lesions, in this study (fig. 5) and as reported by other investigators,[11] are very *suggestive of this relationship. The preliminary* analysis reported on the data obtained for the second screening of populations with negative first smears reveals that a much greater proportion of the newly developed cervical neoplasms are carcinomas in situ. This is what would be expected if this stage were the preceding step to invasive cancer. Additional studies will be required to de-

National Cancer Institute. The results of this investigation, when combined with those of other participating centers, should provide the necessary data required to answer some of the questions regarding the etiology and pathogenesis of uterine carcinoma.

Summary

The salient cytohistological findings have been studied in 65,163 women who had vaginal smears taken by their local physicians over the last 10 years in the course of an office visit. A combined public service and population study has been successfully conducted on a large scale, in predominantly rural areas, completely on a "mail-order" basis. Excellent biopsy and clinical follow-up was obtained, and 9,111 patients returned for repeat screenings.

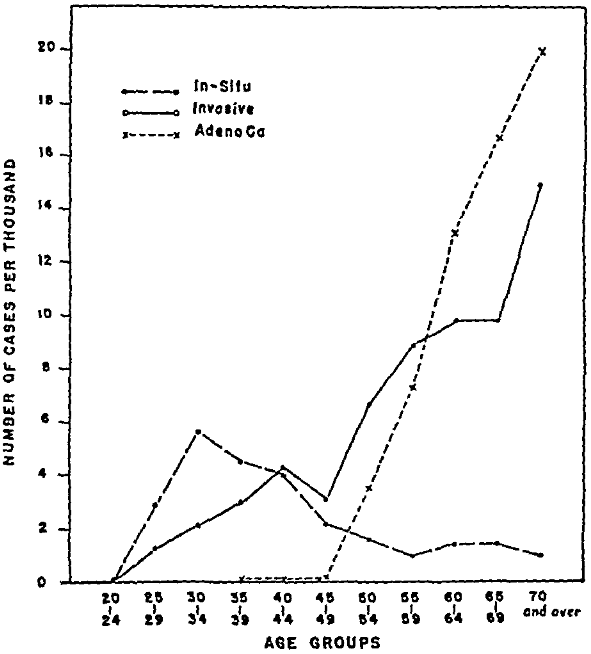

Fig. 5.—Distribution of three types of uterine neoplasms illustrating age relationship of squamous cervical lesions and postmenopausal character of adenocarcinoma of fundus. Adjustment for number of women actually examined in each age group was made on basis of 3,000 randomly selected cases.

The presence of a significant degree of selection in the smears obtained was indicated by particularly high prevalence rates for invasive cervical cancer. More recently the trend has been to screen greater numbers of asymptomatic women, with a concomitant decrease in percentage of total malignancies detected and a relative increase in number of intraepithelial carcinomas discovered.

Reporting as an atypical finding the presence of normal glandular cells in smears of postmenopausal women may be of assistance in improving the detection of adenocarcinoma of the endometrium.

The relationship of in situ to invasive carcinoma is an important problem. In the light of the available information, our data are consistent with the concept that the intraepithelial lesion is an early stage in the development of invasive epidermoid (squamous cell) carcinoma of the cervix.

1300 University Ave. (6) (Dr. Stovall).

Miss Anne Baranovsky, of the Field Investigations and Demonstrations Branch of the National Cancer Institute, aided in making the statistical analysis in this study.

References

1. First International Cancer Cytology Congress: Transactions, Chicago, Oct. 8-11, 1956.

2. Papanicolaou, G. N., and Traut, H. F.: Diagnosis of Uterine Cancer by Vaginal Smear, New York, Commonwealth Fund, 1943.

3. Berg, J. W.; Durfee, G. R.; and Bader, G. M.: Cellular *Detection of Uterine Adenocarcinoma, in First International* Cancer Cytology Congress, Chicago, Oct. 8-11, 1956, pp. 285-290. Cuyler, W. K.; Kaufmann, L. A.; and Carter, B.: Genital Smears in Diagnosis of Adenocarcinoma of Uterus, North Carolina M. J. **11**:494-498 (Sept.) 1950. Erickson, C. C., and Dunn, J. E.: Cytologic Technique in Memphis, Shelby County (Tennessee) Population Uterine Cancer Screening Project: Report on First 60,000 Women Examined, Acta Unio internat. contra cancrum **12**:65-73, 1956. Reference 2.

4. (*a*) Erickson, C. C., and others: Population Screening for Uterine Cancer by Vaginal Cytology: Preliminary Summary of Results of First Examination of 108,000 Women and Second Testing of 33,000 Women, J. A. M. A. **162**:167-173 (Sept. 15) 1956. (*b*) Stern, E.: Cytological Screening for Cervical Cancer: Comparative Findings in Six-Year Survey of Well Population, Cancer **11**:122-126 (Jan.-Feb.) 1958. (*c*) Ullery, J. C.; vonHaam, E.; and Miller, E.: Early Diagnosis and Treatment in Cancer Survey Program: Preliminary Report, Obst. & Gynec. **10**:371-377 (Oct.) 1957.

5. Nieburgs, H. E.; Stergus, I.; Stephenson, E. M.; and Harbin, B. L.: Mass Screening of Total Female Population of County for Cervical Carcinoma, J. A. M. A. **164**:1546-1551 (Aug. 3) 1957.

6. References 4*a* and 5.

7. Masterson, J. G.: Analysis of Untreated Intra-epithelial Carcinoma of Cervix, in Proceedings of Third National Cancer Conference, Philadelphia and Montreal, J. B. Lippincott Company, 1956, pp. 671-677.

8. Jones, H. W., Jr.; Galvin, G. A.; and TeLinde, R. W.: Re-examination of Biopsies Taken Prior to Development of Invasive Carcinoma of Cervix, in Proceedings of Third National Cancer Conference, Philadelphia and Montreal, J. B. Lippincott Company, 1956, pp. 678-681.

9. Dunn, J. E., Jr.: Relationship Between Carcinoma in Situ and Invasive Cervical Carcinoma: Consideration of Contributions to Problem to Be Made from General Population Data, Cancer **6**:873-886 (Sept.) 1953; correction **6**:1258 (Nov.) 1953.

10. Younge, P. A.; Hertig, A. T.; and Armstrong, D.: Study of 135 Cases of Carcinoma in Situ of Cervix at Free Hospital for Women, Am. J. Obst. & Gynec. **58**:867-895 (Nov.) 1949.

11. References 4*a*, 4*b*, and 10.

J.A.M.A., Sept. 20, 1958

OPTIMUM SPACING OF REPEAT FOLLOW-UP PAPANICOLAOU SMEARS

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The results of 15,389 cytological examinations for carcinoma of the cervix uteri have been analyzed for the purpose of deciding how frequently such tests should be repeated. Approximately 65% of the examinations were repetitions on the same women, since the group represented a small, relatively constant segment of the population closely watched over a period of years. In four cases there was a conflict of findings, but with that exception the authors found only a single patient who, having had initially normal smears, exhibited cytological abnormalities at subsequent examinations. The data showed that periodic cytological examination yields diminishing returns and that new cases generally represent the introduction of new members into the group. The evidence led to the conclusion that lengthening the interval between cytological examinations to two years will not appreciably increase the risk to the patient if pelvic examinations are done at the same time.

In 1943 Papanicolaou and Traut[1] published their monograph on the diagnosis of cervical carcinoma by the study of exfoliated cells in vaginal secretions. The applicability and reliability of this technique in the diagnosis of carcinoma of the cervix, particularly in the early stages, has been confirmed by many authors.[2] Knowing that this method could be used for detection and diagnosis, many workers have wished to use it as a routine screening test for cancer. Some enthusiasts have advocated that it be used on all women at intervals of every six months. More recently an interval of one year has been proposed. The technical problems that would arise, if these recommendations were universally applied to the vast number of women in the United States, would be overwhelming. Even if cytological studies are made only once every 12 months, shortages of personnel alone make the plan impractical.

Most of the reported studies have been statistical reviews to determine the value of cytology for the diagnosis of cervical carcinoma. In a few instances, the fate of the patient with an initial negative smear has been studied. Weese[3] makes the statement that 206 patients in his series had two or more cytological examinations over a three-and-one-half-year period. During the period of study no patient initially reported as normal subsequently developed carcinoma of the cervix. Nieburgs and co-workers[4] re-examined 4,182 women who had negative Papanicolaou smears initially; 3.5 per 1,000 were subsequently found to have "carcinoma in situ" after an average observation period of 25 months. We have recently analyzed our own cases to determine the clinical course of patients whose initial smears were negative.

Our observations and evaluations are based on 15,389 consecutive cases seen during a three-year period. Our discussion is limited to cases of primary carcinoma of the cervix. Approximately 65% of our cytological examinations are repeat studies. This includes repeat studies after initial abnormal smears, as well as repeats with an initial negative cytology.

The cytological service at Milwaukee Hospital was begun on a trial basis in 1949. Some patients have been followed yearly for five or more years. This study, however, covers only our experience during the years 1954, 1955, and 1956, selected primarily because records are most complete during that period. These cases represent the private patients of the staff of Milwaukee Hospital (a nonprofit, private, 300-bed general hospital with a closed medical staff). The patients come from the middle class and are of moderate or average circumstances. It has become the practice of the gynecologists at Milwaukee Hospital to routinely obtain cervical scrapings or vaginal secretions for cytological study on all new patients seen by them in their offices. They also routinely repeat cytological studies whenever a patient returns for her periodic physical examination at intervals that may vary from six months to two years. In most cases we receive two slides in the laboratory. Usually both of these are cervical smears. Some of the gynecologists take one smear from the cervix and one from the vaginal pool. A few rely entirely on smears prepared from material in the vaginal pool.

We report our smears with a modified Papanicolaou grading system. Smears are called negative, atypical, suspicious, or positive. The negative report is self-explanatory. An atypical report indicates the presence of abnormal cells which we do not believe are neoplastic; repeat smears, however, are recommended within one to six months. In a suspicious smear we feel that the abnormal cells are probably neoplastic. What the physician does is left to him; but a sharp knife conization is recommended. A positive smear indicates that the laboratory believes that the patient has carcinoma

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From the Milwaukee Hospital.

until proved otherwise. Histological confirmation by biopsy or conization is considered imperative by us.

The relationship between this laboratory and the practicing physician who sends cytological smears to it for examination has been so close that problems of follow-up and treatment are minimal. Over the years we have been able to follow 90% of the patients who received a cytological diagnosis of suspicious or positive. Of those patients who received diagnoses of "atypical," 51.5% have been reexamined. Since our study has been drawn entirely from private patients, follow-up studies are available not only on the known abnormal but also on a great many of the normal patients. Because of the liaison between physicians of metropolitan Milwaukee, it is also possible to follow the course of these women, even into other hospitals and other laboratories. During the period of this study, only two cases of unsuspected cervical carcinoma have been found in 1,654 hysterectomies performed for various reasons. Neither of these patients had had cytological studies.

TABLE 1.—*Age of Patient When Cervical Carcinoma Was Diagnosed*

Age	Patients No.	Patients %
Under 25	1	1.4
25-30	10	12.5
31-35	13	16.2
36-40	12	15.0
41-45	13	16.2
over 45	31	38.7
Total	80	100.0

The patients in this study represent a small, relatively constant segment of the population which has been closely watched over a period of years. Our experience, similar to that of many others, has been that carcinoma of the cervix appears relatively early in life (table 1). If this observation is correct, one would expect diminishing returns from restudying the same segment of population. This also appears to be true (table 2).

TABLE 2.—*Incidence of Proved Cervical Carcinoma*

	Cases Screened	Patients with Carcinoma	
		No.	%
1950-1952	2,170	19	0.88
1953	2,060	26	1.26
1954	3,347	28	0.84
1955	5,213	24	0.46
1956	6,829	29	0.41
1957	7,873	42	0.54

Table 3 represents a summary of our data. In 1954, 3,347 cases were screened. There were 301 abnormal smears (including atypical, suspicious, or positive). Twenty-eight cervical carcinomas were detected. There was one false-negative smear which in review contained a few cells that might have been classified as "atypical."

In 1955, 5,213 cases were seen. There were 423 abnormal smears. Twenty-four cervical carcinomas were diagnosed in these women. As in 1954, all but one had abnormal cytology. This case in review also showed cells which might have been considered "atypical."

In 1956, 6,829 patients were screened and 232 abnormal smears were found. Twenty-nine cervical carcinomas were subsequently diagnosed. There were two false-negative results. In reviewing these smears, we considered one false-negative due to technically poor smears. This case, in addition, proved to be a well-differentiated papillary type of epidermoid (squamous cell) carcinoma. The other false-negative was from a patient who had a large carcinomatous ulcer of the cervix. We believe the smear was obtained from the surface and consisted mainly of debris and exudate.

In these four cases of false-negative smears, the true diagnosis was made by biopsy within a month after the smear was obtained, since all patients had clinical evidence of cervical pathology. In the past seven years, including the years 1954, 1955, and 1956, with the exception of these four cases, only one patient with an initial negative smear has subsequently exhibited abnormal cytology. Two years after the initial negative cytology report, this patient had a smear diagnosed as atypical. Seven months after this, biopsy disclosed carcinoma of the cervix, in situ. The total period of follow-up for our normal patients has varied from six months to two and one-half years. In fact, included in this study are patients with initially negative smears studied prior to 1954 who are still normal. Conversely, the interval from the initial finding of an abnormal cytological smear to final diagnosis of cancer has never exceeded 12 months. Eight patients with proved carcinoma initially had "atypical" smears. Within 12 months repeat smears were called suspicious or positive, and cervical biopsy showed carcinoma (table 4). The time interval varied from 1 month to 11 months.

TABLE 3.—*Statistical Review 1954-1956*

	1954	1955	1956
Total patients	3,347	5,213	6,829
Total abnormal smears	301	423	232
Proved cervical carcinoma	28	24	29
False-negative smears	1	1	2

It is apparent from a review of our statistics that, when the same segment of the population is reexamined periodically, the number of new carcinomas of the cervix discovered by the Papanicolaou technique becomes progressively less and appears to represent in the main the introduction of new persons into the group. In our experience, in contrast to Nieburgs', a negative Papanicolaou smear, when associated with negative physical findings as revealed by a thorough pelvic examination, indicates that the patient will not develop carcinoma of the cervix within a period of two years. This represents an average figure which will probably increase as our patients continue to be followed. We feel that cytological examination of the cervix, when accompanied by pelvic examination, can be done at intervals of two years without risk to the patient. We also believe that such a program will not lower the current high five-year survival or cure rate of cervical carcinoma which has been achieved in part because of the reliability of cytology as a screening and diagnostic procedure.

Table 4.—*Time Interval Between Initial Diagnosis of "Atypical" Smear and Diagnosis of Cervical Carcinoma in Eight Patients*

Case No.	Time, No.	Diagnosis
1	7	In situ
2	9	In situ
3	1	Stage 1, early
4	11	In situ
5	10	In situ
6	3	Early, stage 1
7	2 wk.	Stage 1
8	..*	Stage 1

* Biopsy taken with smear.

Summary

In summary we have evaluated the fate of the female patient who has had a cytological examination made and received a negative report. Based on the statistical follow-up for three years and on our impressions covering a period of approximately seven years, it would appear that a negative cytological examination, when associated with negative physical findings following a thorough physical examination of the patient, implies that the patient is free of carcinoma at that time and will remain free of cervical carcinoma for a period of at least two years. If these observations can be substantiated, the application of the cytological examination will become greatly simplified, since it need not be repeated as often as has been recommended in the past.

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References

1. Papanicolaou, G. N., and Traut, H. F.: Diagnosis Uterine Cancer by the Vaginal Smear, New York, Commo wealth Fund, 1943.

2. Birge, E. A., and Carlson, D. J.: Experience w Cytology in Diagnosis of Uterine Carcinoma in Private Hospital, Am. J. Clin. Path. **26:**277-282 (March) 1956. Slate, T. A.; Martin, P. L.; and Merritt, J. W.: Cytological Detection of Uterine Cancer in Private Obstetrical Practice Based on Analysis of 104 Consecutive Positive and Suspicious Smears from 8,148 Private Patients, Am. J. Obst. & Gynec. **66:**878-890 (Oct.) 1953. Dale, E. H.; Brines, O. A.; Wilson, G. S.; and Nelson, H. M.: Role of Exfoliative Cytology i Diagnosis of Carcinoma of Cervix Uteri, ibid. **74:**25-3 (July) 1957.

3. Weese, W. H.: Three Year Evaluation of Vagina Papanicolaou Smears in Gynecological Office Practice, J Louisiana M. Soc. **109:**77-81 (March) 1957.

4. Nieburgs, H. E.; Stergus, I.; Stephenson, E. M.; an Harbin, B. L.: Mass Screening of Total Female Populatio of County for Cervical Carcinoma, J. A. M. A. **164:**154 1551 (Aug. 3) 1957.

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CONGENITAL TOXOPLASMOSIS—DIAGNOSTIC IMPORTANCE OF CHORIORETINITIS

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Recently reported clinical studies[1] should increase considerably our respect for congenital toxoplasmosis. The classic disease is common enough, but its lesser forms, generally unappreciated, are responsible for a tremendous amount of visual disability and account for a certain number of previously unexplained cases of mental retardation.

This concept is not entirely new, but has developed over the years with almost painful slowness. Perhaps the most effective barrier to its understanding has been the technical difficulty of ophthalmoscopic examination, particularly in infants and young children. Chorioretinitis is the most constant finding in the congenital infection. Indeed, the eye inflammation may be the only manifestation of the disease. No idea as to the true incidence of congenital toxoplasmosis can be ob-

In the eye, the most minute focus of inflammation due to congenital toxoplasmosis is recorded permanently as a pigmented chorioretinal scar. Typically, each macula is attacked with disastrous effect on vision. Serologic examinations are most important. If either the patient or his mother shows no serologic evidence of past infection, a diagnosis of congenital toxoplasmosis should be disregarded. The inexperienced examiner must be warned against the many other pigmented and central retinal conditions with which chorioretinitis may be confused. The greatest help that can be obtained in the matter is wide dilation of the pupils. Only increased awareness will lead to an accurate determination of the incidence of the disease.

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tained, then, until physicians generally become acquainted with its typical ocular signs. It is the purpose of this paper to describe the characteristic eye findings, along with the ophthalmoscopic appearance of other common fundus changes with which chorioretinitis may be confused.

Incidence and General Findings

Human toxoplasmosis went unrecognized until 20 years ago. The parasite responsible for the disease, Toxoplasma gondii, was well known in both wild and domestic animals prior to that time, but man's susceptibility was not realized until the description of the congenital form of the infection in 1939.[2] In the years that followed, it became clear that toxoplasmosis is one of the commonest diseases of mankind. Positive immunological and serologic tests indicating past or persistent infection by the parasite have been found in one-fourth to one-third of all adults in almost every population studied.

Obviously, the vast majority of human infections go unattended by symptoms. A fatal outcome has been proved in a scant half-dozen cases of the acquired variety. Mothers of congenitally infected infants rarely recall a febrile illness during their pregnancies. The congenital disease itself, however, is characterized by severe inflammatory changes in the brain and eyes and is manifested clinically by any or all of the following signs: mental retardation, convulsions, internal hydrocephalus, intracerebral calcification, microphthalmia and bilateral chorioretinitis with reduced central vision, myopia, nystagmus, and squint. We owe much of our knowledge of the pathology of toxoplasmosis to the congenital infection, since most studies of the acquired disease are limited to serologic and parasitological investigation of the body fluids.

Eye Findings

The meningoencephalitis of congenital toxoplasmosis may be so mild as to leave no lasting effect. Even inflammatory foci large enough to result in intracerebral calcification visible on x-ray need not cause convulsions or a dulling of the intellect. In the eye, however, the most minute focus of inflammation is recorded permanently as a pigmented chorioretinal scar. Typically, each macula is attacked with disastrous effect on vision. In many cases, however, only one eye is involved or the inflammation may be central in one eye and peripheral in the other. Theoretically, if the infection can be limited to the peripheral retina in one eye, it may be so in both, and, conceivably, if one eye can escape the disease completely, each may escape, so that the possibility of a congenital infection with no apparent defect in either brain or eye is of at least academic importance.

The commonest situation is that in which only the eyes are seriously involved, so that in making the diagnosis one has to depend on a history of lifelong visual disability, the ophthalmoscopic examination, and serologic testing of mother and offspring. Serologic examinations are most important. If patient or mother shows no serologic evidence of past infection, a diagnosis of congenital toxoplasmosis should be disregarded. Even weakly positive tests in both indicate that toxoplasmosis may be considered. A history of congenitally poor eyesight is important if present, but it sometimes is lacking since central vision may be partially preserved or even unaffected if only the peripheral retina is involved.

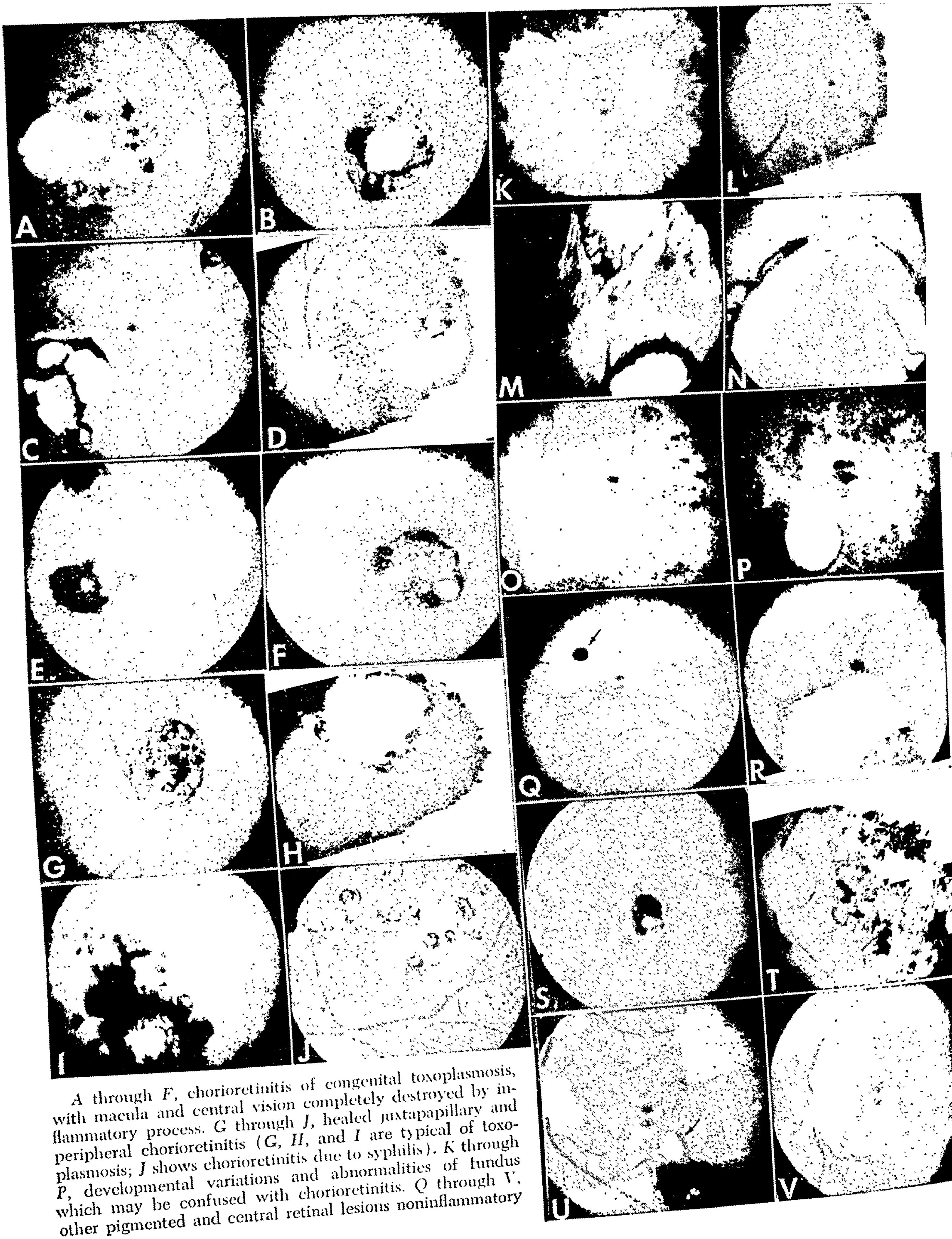
The eye findings themselves are so characteristic as to be almost diagnostic of the disease. Infection early in fetal life or prolonged or severe inflammation may disorganize completely one or both eyes, but this is not the usual situation. Typically, the parasite settles in each macula to produce a focal chorioretinitis (see figure, *A* through *F*). In addition, there may be any number of scattered foci of inflammation in the retinal periphery (figure, *G* through *J*). Early, the vitreous may be filled with exudate preventing a good view of the fundus, but the exudate itself is indicative of active chorioretinitis. The patches of inflammation are usually large and few in number (see figure, *G*, *H*, and *I*), as compared with the chorioretinal lesions of congenital syphilis (see figure, *J*). A tendency toward recurrence is characteristic of the chorioretinitis of toxoplasmosis. The parasite may lie dormant in its encysted stage for many years. In one eye shown in the figure (*E*), lifelong poor vision was further reduced by recurrence of the inflammation when the patient was 29 years of age.

Something about the anatomy or physiology of the central retina attracts or permits the growth of the parasite. The infection is undoubtedly borne via the blood from the placenta, but why nervous tissue is especially likely to be affected and why the macula is more susceptible than the peripheral retina cannot yet be explained. The fetal state has something to do with the location of the chorioretinitis of congenital toxoplasmosis, since the chorioretinitis associated with acquired toxoplasmosis in adults usually is peripheral and unilateral.

At any rate, congenital central chorioretinitis, especially if bilateral, should be thought of as being due to toxoplasmosis until proved otherwise. Fortunately for the examiner, central chorioretinitis is easily discovered, situated as it is at the posterior pole of the eye within easy view. Unfortunately for the patient, destruction of the central retina by the inflammatory process abolishes central vision. If each macula is seriously involved, accurate fixation is impossible and nystagmus and squint are likely developments.

Differential Diagnosis

The inexperienced examiner must be warned against the many other pigmented and central retinal conditions with which chorioretinitis may be confused. Developmental abnormalities and defects are often misleading. Some of these are shown in the figure (*K* through *P*). The normally striped (tigroid) appearance of the fundus of some heavily pigmented members of the Caucasian race is show in *K*. A case of medullated optic nerve fibers i illustrated in *L*. The pigment-ringed defects in *M* closely resemble healed chorioretinitis, except



A through *F*, chorioretinitis of congenital toxoplasmosis, with macula and central vision completely destroyed by inflammatory process. *G* through *J*, healed juxtapapillary and peripheral chorioretinitis (*G*, *H*, and *I* are typical of toxoplasmosis; *J* shows chorioretinitis due to syphilis). *K* through *P*, developmental variations and abnormalities of fundus which may be confused with chorioretinitis. *Q* through *V*, other pigmented and central retinal lesions noninflammatory in origin.

they were arranged in a row below the right nerve head in the usual position of a coloboma of the choroid and were associated with a typical coloboma in the left eye (*N*). Congenital grouped pigmentation (bear tracks) of the retina is shown in *O* and the bone corpuscle shaped pigment deposits of retinitis pigmentosa in *P*.

Neoplastic, traumatic, and vascular lesions may be mistaken for inflammatory changes (see figure, *Q* through *V*). In *Q*, the arrow indicates a small, benign, flat nevus of the choroid. A large malignant melanoma of the choroid is shown in *R*. Contrecoup rupture of the choroid at the posterior pole in contusions of the globe leaves large pigmented scars, as in *S* and *T*. A history of injury is helpful in these cases. Disciform degeneration of the macula is probably vascular in origin. The juvenile type (*U*) is often confused with inflammatory lesions. The age of the patient helps to distinguish the senile form (*V*).

The appearance of the fundus of the fellow eye often helps to clarify the situation. Actually, the bilateral, pigment-ringed, central retinal scars of congenital toxoplasmosis are so distinctive that they should be recognized with little difficulty.

The greatest help that can be obtained in the matter is wide dilation of the pupils. Even the most experienced ophthalmoscopist depends upon this aid. No contraindication to dilatation of the pupils exists in children or young adults. It is only a very occasional middle-aged or older adult with shallow anterior chamber (narrow chamber angle) in whom caution should be observed in the use of mydriatic drugs. The latest concepts of glaucoma are reassuring in this regard. One or two drops of a 10% solution of phenylephrine hydrochloride (Neo-Synephrine) may mean the difference between success or failure on any funduscopic examination. If the action of this mild and short-lasting agent is resisted by the pupils of aged or very young persons, a 2% solution of homatropine hydrobromide should produce the desired effect.

Conclusions

If ophthalmoscopy were a simple technique, the frequency of congenital toxoplasmosis would have been appreciated years ago. Following the uncontrollable eye movements of very young or uncooperative children or even those of adults with squint or nystagmus can be a most trying experience. The advice of an eye surgeon should probably be sought in any questionable case, but many instances of congenital toxoplasmosis will go unrecognized or misdiagnosed unless the general practitioner, the pediatrician, and the internist make real use of the ophthalmoscope. Increased awareness will lead eventually to an accurate determination of the incidence of the disease. Only then can it be decided whether this condition constitutes a real public health problem and how to go about its prevention.

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References

1. Hogan, M. J.: Ocular Toxoplasmosis, Tr. Am. Acad. Ophth. **62:**7-37 (Jan.-Feb.) 1958. Fair, J. R.: Congenital Toxoplasmosis: Chorioretinitis as Only Manifestation of Disease, to be published.

2. Wolf, A.; Cowan, D.; and Paige, B. H.: Human Toxoplasmosis: Occurrence in Infants as Encephalomyelitis: Verification by Transmission to Animals, Science **89:**226-227 (March 10) 1939.

ADJUSTMENT PROBLEMS OF THE AGED.—Unlike biological systems, human social systems are structured not by the genetically determined reaction patterns of the biological units that compose them, but by behavior patterns invented and acquired in social interaction. These socially derived patterns constitute the systems of cultural values which determine the social structure of human groups. Such structures do not age and die. They either commit suicide by man's inability to devise new patterns capable of dealing with the problems generated from within, or they are murdered by his inability to repel conquest from without. A social system is simply the blueprint according to which interpersonal and social functions have occurred in the past, are occurring in the present, and may be predicted to recur in the future. Therefore, the aging of an individual, as a sociocultural phenomenon, is defined not by physical deterioration or by time but by the value system of his society. A person is sociologically old when he is so regarded and treated by his socii. The problems of personal and social adjustment confronting the aged are the resultants of the role and status accorded them by the group, the social provisions for their continuing prestige and security, and the opportunities afforded them to achieve these ends by their own initiative.—H. E. Jensen, Ph.D., Sociological Aspects of Aging, *Public Health Reports*, July, 1958.

MEDICAL PREPAREDNESS

Major Gen. Silas B. Hays (MC), U. S. Army

The best method to build toward national medical preparedness for war is local preparedness for peacetime disasters. This can be encouraged through the national, state, and local medical, dental, veterinary, and nursing associations. The stockpiling of medical supplies and equipment should be encouraged. The role of each paramedical group should be determined. These groups need guidance and will probably accept it from the medical profession if it is enlightened and realistic. If organized medicine does not offer guidance, or offers it in unacceptable form, it will be supplied by some other agency. The elements of medical preparedness are training, equipment, and organization. All three are essential. If the local community will prepare itself to cope adequately with local peacetime medical emergencies, it will have gone a long way toward preparing itself for a wartime disaster.

When we use the term "medical preparedness," just what are we talking about? Words and phrases frequently connote different ideas to different persons; hence, the speaker often finds it advisable to delineate exactly what he means. By medical preparedness I mean the preparation, through training and through posture, to meet medical emergencies resulting from natural disasters, such as earthquake, fire, flood, and tornado—and also resulting from war. Inherent in this definition is the idea that many individuals will be affected. It seems to me to be axiomatic that preparedness to deal with an emergency involving many individuals will automatically result in preparedness to handle an emergency involving a single or a few individuals.

Why is it desirable to improve our medical preparedness? Have we not always handled our medical emergencies in both peace and war reasonably well? The answers to these questions are important. If we are already doing all right then let us forget about the whole thing. On the war combat side the answer is obvious; things have changed and are changing rapidly. Newer weapons of war can inflict casualties on a scale previously impossible. On the natural disaster side the answer is not so obvious, but it is clear. We have not always done a good job in handling medical emergencies. Advances in medical knowledge in the last quarter-century have frequently not been put to use. It is important that the medical profession realize this and further realize that a peacetime medical emergency can occur any place. We have not learned how to prevent bus, train, or airplane crashes, hurricanes, tornadoes, floods, or fires. If the local medical community will prepare itself to cope adequately with these, it will have gone a long way toward preparing itself for a wartime disaster.

The elements of medical preparedness are people —people trained, equipped, and organized. Hence, it seems reasonable to discuss the problem under these three headings: training, equipment, and organization. I will not attempt to evaluate the relative importance of the three. They are all essential to a successful program.

Training

What are the medical problems for which the people must be trained? The list is small: physical trauma, thermal burns, radiation, infection, and chemical agents. None of these is peculiar to a peacetime or to a wartime disaster.

The principles and procedures of handling physical trauma are known and widely publicized. But too few members of the medical profession are familiar with them, and, sad to say, many who do know them fail to follow them in an emergency. I will mention a few: control of hemorrhage, including proper use of the tourniquet; splinting fractures prior to transport; resuscitation; proper débridement; proper surgery; and secondary (not primary) closure. Time and again in emergencies all of these principles have been violated by doctors who knew better.

Our knowledge of the treatment of burns still leaves much to be desired. Too few physicians are up to date on the knowledge we do have, yet the mortality among serious burn cases can be reduced markedly with modern methods.

With the increasing use of radioactive substances in medicine and industry and with the transport of these substances from place to place, the hazard of accidents involving radioactive materials is increasing to the point that every physician should acquire some basic knowledge in the handling of such accidents.

Secondary infection is always a problem in physical trauma and in burns. The principles of its prevention and treatment are well known, but all too frequently they are not applied. Primary infection or infectious disease is a problem in peacetime disasters where water supplies and sewage systems are compromised. The same applies on a larger scale to wartime situations, plus the possibility, however remote, of biological warfare.

The Surgeon General, U. S. Army.

Chairman's address, read before the Section on Military Medicine at the 107th Annual Meeting of the American Medical Association, San Francisco, June 25, 1958.

Chemical agents are becoming increasingly important as hazards in our industrial society. Those physicians with a practice involving industrial workers are alert to these hazards and are familiar with their prevention and treatment. But a large segment of our profession has at most a sketchy knowledge in this field. In peacetime and wartime emergencies, particularly those involving explosions and fires, chemical agents may be an important problem. In wartime there is also the ever-present hazard of the use of toxic chemicals, including the newer, fantastically potent nerve gases.

So far I have tried to stress the need for the training of the medical profession in the United States to be better prepared to meet emergencies. I have tried to point out the similarity of the problems to be faced in these emergencies whether they be peacetime accidents or the result of enemy action. This is important because if we hope to get members of our profession to devote time to these problems they must first be convinced of the possibility that they as individuals may sometime be in a position where they need this knowledge. Experience in the last decade has demonstrated that a large proportion of our profession believes, rightly or wrongly, the possibility of war to be so remote that training in civil defense for medical emergencies is not worth the time and effort required.

Experience in both peacetime and wartime emergencies has shown that a large proportion of the care of casualties must be performed by individuals who are not doctors of medicine. In mass casualty situations the number of casualties may be out of all proportion to the number of doctors available at the time and place and may, in fact, be out of all proportion to the number of paramedical personnel available. This means, then, that on the injured individual himself or his neighbor or "buddy" may fall the responsibility for emergency lifesaving care. It is clear that the need for training must include not only the medical profession itself and the paramedical personnel but also the population as a whole, each group trained to a different level of competence.

Within the medical profession a good start has already been made, but it is only a start. The Medical Education for National Defense (MEND) program has now been in existence since 1952. Beginning in 5 medical schools, it is now in 45 schools and it is hoped that within four years all of the medical schools of the United States will be active participants. The U. S. Army, Navy, and Air Force, the U. S. Public Health Service, and the Federal Civil Defense Administration have contributed funds to help support this program and also furnish assistance in the form of lectures, literature, films, short courses for school coordinators, and various other aids. Participation in the program by the schools is voluntary, and each school carries out the program in its own way as it deems best. I have no doubt that some are better programs than others. However, as more experience is gained it is reasonable to expect that the over-all level of quality will be raised. The two objectives of the MEND program are to convince the embryo doctor early in his career of the importance of preparing himself to handle medical emergencies and to give him specific knowledge and specific skills which he can use.

Chronologically, next in the young doctor's career is his internship. Here he usually is faced with emergencies involving one or a few individuals, and he has the chance to apply his knowledge. Next, he usually enters one of the military services for two years. In my opinion it is the clear-cut responsibility of the Army, Navy, and Air Force to train these young men for peacetime as well as wartime medical emergencies. All three services are now doing this, but I am convinced that they can and should do a better job.

On return to civil life the young doctor enters practice or begins additional and, usually, specialty training. The thought of an emergency involving many casualties becomes remote. He is too busy to concern himself with additional training or with the training of others. Occasionally his local or state medical society may include on one of its programs something concerning medical preparedness, and occasionally he may read an article along this line in one of his journals. The knowledge and skills he has previously acquired are not lost, but they will become rusty. If he was properly trained in medical school, in his internship, and in the military service he can probably be depended on to give a good account of himself as an individual doctor in a medical emergency, even though for years his professional interest may have been so far afield as, for example, allergy or geriatrics. But in a mass casualty situation competent performance as an individual doctor is not enough. He must be a leader—directing and supervising the work of paramedical personnel if the maximum number of lives are to be saved. I believe that the doctor in practice—and this comprises the bulk of the medical profession—presents the most fertile field to till if we are to improve national medical preparedness.

Still on the subject of training, paramedical personnel must be considered. In a mass casualty situation it is on these groups that will fall the bulk of the actual medical work. In this over-all broad categorization are dentists, veterinarians, nurses (both registered and practical), dieticians, physiotherapists, pharmacists, and medical technicians of various types. Not to be excluded are those engaged in the administrative facets of medical care—hospital administrators, medical record librarians, supply men, and a host of others.

By and large these groups are clamoring for guidance. What will be their functions in an emergency situation? Unless they know, they are at a loss to prepare. In my opinion, the medical profession, and in this indictment I include both civilian and military medicine, has been remiss in failing to give guidance to these groups.

In a mass casualty situation, are dentists to be limited to care of teeth, mouth, and maxillofacial injuries? Will they be called on to administer anesthesia, local or general? Are they to do débridements? Unless they know the answers to these questions they cannot prepare. A similar situation exists regarding nurses. What will they be called on to do in a mass casualty situation? Unless the medical profession of the United States lets them know, they, likewise, cannot prepare.

I believe the MEND program is an important step toward medical preparedness. Furthermore, I believe a Dental Education for National Defense (DEND), a Veterinary Education for National Defense (VEND), and a Nursing Education for National Defense (NEND) program would be of inestimable value. These professions are willing and anxious to institute such programs in their schools, but we in the medical profession have failed to furnish guide lines and to delineate functions. I realize the problem is not simple. It involves traditions, creeds, jealousies, licensing laws, and the quality of medical care. But an ostrich-like position is untenable. The medical profession must face it.

What is to be expected of these paramedical groups in a mass casualty situation? If the medical profession does not tell them, who is to? The Congress? The state legislatures? Their own national organizations? These groups need guidance. Are they going to get it from the medical profession, or will they get it elsewhere? In all probability they will accept guidance from organized medicine, but it must be enlightened and realistic. If no answer is forthcoming or if the only answer is one which, in their eyes, is degrading, they will not accept it. These are strong words but I believe they are true. Today American medicine can give the answers. It can call the shots. If it gives the wrong answers or if it continues to give no answer at all, then some other tribunal may fill the void.

I urge on American medicine that this problem be faced forthwith and that a determination be made of the functions to be performed by the professions in emergencies which involve masses of casualties. Once these determinations are made, then the problem of training becomes, perhaps, not an easy one, but at least one which can be grasped. In undergraduate schools there can be DEND, VEND, and NEND programs. In postgraduate life there can be short courses, symposiums, and community exercises involving these groups, as well as the medical profession, on a stimulating and realistic basis.

Equipment

So far I have been talking about training. Basically, training applies to the individual and what knowledge and skills he can be taught. Next, I would like for a few moments to discuss equipment. To repeat an earlier statement, the elements of medical preparedness are people—people trained, equipped, and organized. In the usual peacetime medical emergency, equipment and supplies are adequate, if not in the immediate area at least close enough to be brought in by air or surface transportation. In a wartime emergency, equipment and supplies will be critical but never, in my opinion, as critical as trained manpower. This is no reason to neglect the importance of supplies and equipment. In planning for peacetime emergencies emphasis can and should be placed on inventories of existing material, i. e., knowing how much is available locally and where. In those instances where shortages exist, for example, whole blood plans must be made for procurement and distribution. In planning for wartime emergencies, envisioning the destruction of hospitals and warehouses of supplies, emphasis must be on nationa stocks and national production. In essence, suppl planning for peacetime disasters is a local matte —for wartime disasters both a local and a nationa matter.

Organization

The final element in national medical preparedness is organization. Organization is one of the bugbears of any large effort, whether it be General Motors Corporation or the Department of Defense. It has been a particularly difficult one in any civil defense effort. One of the principal stumbling blocks has been, in my opinion, the fact that the assumption of an enemy attack on the United States presents such a staggering problem that many people tend to throw up their hands in despair and say that the only solution is martial law. The military, on the other hand, says that even if martial law is declared there are too few military personnel to do all the work which will need to be done.

Many authorities or organizations believe that an organization should be built from the bottom up and not from the top down. To me this is a sensible approach to the problem of medical preparedness. Local communities, under medical leadership, can organize to meet local civilian disasters. Assignments can be made covering members of the medical profession and of the paramedical professions. Supplies, equipment, and buildings can be located and earmarked for use and a realistic training program undertaken, including realistic exercises involving hospitals, clinics, emergency aid, and evacuation units. In some communities this is already being done, but in most it is not.

If there are adequate local organizations it will not be too difficult to weld them together under a state organization, whether it be through the mechanism of the state government or of the state medical association. The prime hurdle is the local one, and it is basically a lack of motivation. People wil organize and train voluntarily if they believe th need is real. To date, with some outstanding excep tions, the communities of the United States apparently believe that the need to prepare is remote and that it is not worth the time and the effort.

Recommendations for Preparedness

This paper would not have a proper military tone unless it included recommendations. Here is what I propose to improve national medical preparedness:

Emphasize desirability of local preparedness for peacetime disasters as serving the dual purpose of preparing for such disasters and of being the best method to build toward national medical preparedness for war. Encourage this through the national, state, and local medical, dental, veterinary, and nursing associations. Likewise, encourage this through the corresponding educational associations, such as the Association of American Medical Colleges.

Encourage the acquisition and stockpiling of additional medical supplies and equipment by local agencies, such as hospitals, and by the Federal Civil Defense Administration.

Determine the role of dentists, veterinarians, nurses, and paramedical groups in the event of emergencies involving mass casualties. The A. M. A. should take the initiative in this and should consult with the respective national professional associations. When agreements have been reached they should be published for information of all those who are concerned.

Stress training for medical emergencies through the expansion and improvement of the MEND program; establish similar programs in schools of dentistry, veterinary medicine, and nursing; improve training in the military services of medical, dental, and veterinary officers, nurses, and enlisted men on active duty; improve training programs for military reservists; and expand and improve emergency-care training programs for the lay public through public schools, Red Cross chapters, hospitals, factories, and civil defense organizations. Again, here the impetus must come from the medical profession. Doctors must not only preach the necessity of these training programs and help organize them but also carry much of the load of actual teaching.

These actions require leaders—leaders at all levels who are convinced that our medical preparedness must be improved and who are willing to devote time and effort to the job. This is not something like a community chest drive that is over in a few weeks. This is a continuing need. We will never be prepared to do a perfect medical job in an emergency, but if we are trained, equipped, and organized we can save the lives of many who otherwise will die.

ASSOCIATION OF CHOLELITHIASIS, HIATUS HERNIA, AND DIVERTICULOSIS COLI

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Cholelithiasis, hiatus hernia, and diverticulosis (Saint's triad) are found together more frequently than can be expected on the basis of chance alone. Age, congenital structural weakness, constipation, obesity, and childbearing are considered contributory etiological factors. Although the main clinical interest in the triad centers about cholelithiasis and hiatus hernia, it seems worthwhile to point out that in 13 of the 24 cases, there was x-ray evidence of diverticulitis, namely, irritability of the colon in the region of the diverticula. Awareness as to the existence of the triad has practical clinical value and may explain an apparent failure to effect a cure.

Various authors [1] have described the association of cholelithiasis with hiatus hernia. Other authors [2] have emphasized the coexistence of diverticulosis coli with cholelithiasis or with hiatus hernia. In 1948, Muller,[3] of the department of radiology at the General Hospital in Johannesburg, South Africa, reported the simultaneous existence of hiatus hernia, diverticulosis coli, and cholelithiasis in three female patients. The combination was named "Saint's triad" in deference to a colleague, Professor Saint, who had called Muller's attention to it.

The next mention of this triad in the English literature was a report of five cases by Palmer [4] in 1951. However, in 1950 and in 1951, the French authors Brombart and co-workers [5] and Wissmer [6]

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independently described three and seven cases respectively. Later, in 1955, Palmer[7] enlarged his series to 24 cases.

Being cognizant of the triad through these reports, we were impressed with the relative frequency with which it was encountered in the group of patients referred to the Cancer Diagnostic Clinic. Our interest being thus stimulated, an effort was made to learn more of the nature and occurrence of the three conditions in a single individual. The findings of this study are herewith presented.

Table 1.—*Separate Incidence of Cholelithiasis, Hiatus Hernia, and Diverticulosis Coli*

	Patients Studied	Positive Cases	Incidence, %
Cholelithiasis	957	157	16.4 (p_1)
Hiatus hernia	1,296	182	14.0 (p_2)
Diverticulosis coli	1,309	216	18.7 (p_3)

Materials and Methods

The records of 2,020 consecutive unselected patients provided the material on which this study was based. In accordance with the clinic policy of admitting patients only on physician referral, essentially all patients were symptomatic and approximately 70% had some complaint referable to the gastrointestinal system. The ratio of females to males was 2.5 to 1. The average female age was 46 years and the average male age 49.

To determine the probable occurrence of the triple association from chance alone, calculations were first made of the percentage incidence of cholelithiasis, hiatus hernia, and diverticulosis coli in those patients of the basic group who had been appropriately studied. There were 957 patients who had cholecystograms; barium enemas were done on 1,296 patients, and 1,309 patients had an upper gastrointestinal x-ray series. With use of the percentages obtained, the formula $P = p_1 \times p_2 \times p_3$ was applied, and the value obtained represented the probability of all three conditions occurring in a single individual on the basis of chance.[8] For comparison, the actual rate of occurrence of the triad was then determined in 713 patients who had been examined by all three x-ray methods.

Another group of 58 patients had had a cholecystectomy for gallbladder disease and stones prior to being examined at the clinic. In these, only an upper gastrointestinal series and barium enema were done. The combination finding of hiatus hernia and diverticulosis coli in these patients has been designated for discussion purposes as the postcholecystectomy triad. The mathematical probability and actual occurrence were similarly computed and compared.

Analysis of Data

From the percentages in table 1, a P value applicable to the 713 patients examined with three x-rays was obtained as follows: $P = p_1 \times p_2 \times p_3 = 0.164 \times 0.14 \times 0.187 = 0.004$. For the 58 postcholecystectomy cases, the P value was a product of $p_2 \times p_3 = 0.026$.

It can be seen from table 3 that the actual incidence of the triad is considerably greater than that expected purely from chance in both groups studied, indicating that there are other contributory factors.

Attention is directed to table 2 showing the relatively high incidence of the hiatus hernia–diverticula combination among the 58 patients in whom cholecystectomy had been previously performed. It is indicated from the P value in this group B that since one-third of a triad was known to have existed the mathematical probability of finding the remaining conditions is 6.5 times greater than in the general population, as represented by group A. Clinical verification of this calculation can be seen by comparing the incidence of the hiatus hernia-diverticulosis combination (2.6%) among the 713 patients completely studied (table 4) with the percentage of this same association in the patients with postcholecystectomy triad (19%).

From a different perspective, Palmer reported 24 cases of the triad (complete postcholecystectomy) in relation to 170 patients with hiatus hernia for an incidence of 14%. Among our 182 patients with hiatus hernia, there were 35 with the triple combination, including both groups A and B, which represents an incidence of 19.1% if similarly calculated. These results suggest that with a history of cholelithiasis or demonstrable hiatus hernia the possibility of a triad existing increases considerably. It could be added that diverticulosis coli has not been proved to be as helpful as a diagnostic lead.

In an analysis of this type, it is to be expected that a certain number of dual combinations would be found. These are tabulated in relation to triad cases in 713 patients having all three x-ray studies.

The finding of 75 combinations representing a rate of occurrence of 10.5% in 713 cases completely studied bears emphasis. It points up the value of performing all three x-ray examinations in any patient with gastrointestinal complaints who requires any single one.

Clinical Features of the Triad

The 24 patients with all three conditions existing when examined were analyzed for characteristic details. The age range was from 50 to 82 years, with an average of 68. In Palmer's series, the age range was from 35 to 73. The average age for Wissmer's seven patients was 66. Generally speaking the condition is rare in persons under 50 years of age but likely to occur in persons over 60.

Table 2.—*Incidence of Complete and Postcholecystectomy Triad*

Group	Method of Examination	Patients	Triad	Incidence, %
A	3 x-rays	713	24	3.4
B	Cholecystectomy and 2 x-rays	58	11	19.0

There were four males among 24 cases of complete triad and two males among the 11 cases of postcholecystectomy triad. Even allowing for the female predominance of 2.5 to 1 in the clinic group at large, it was definitely more common among women in this series. Muller's three original cases were in women. However, in Palmer's series of 24 cases, there were 14 males. Although not stated, it might be presumed that this male predominance reflected the fact that Army personnel comprised the greater part of his basic group examined.

All females except one had borne children. The average number was four. Muller emphasized multiparity as being characteristic. Fifty per cent of the females were definitely obese. Two of the males in this series were obese. While not essential to the development of the triad, obesity in females was nevertheless common in other reported cases.[9] No ethnic group predominated. Muller considered Jewish women as most susceptible, but that was not noted in this series.

Thirteen of the 24 patients had epigastric pressure, pain, or a burning sensation as the main gastrointestinal complaint. Three had gallbladder colic as the most prominent symptom. Two experienced principally bloating and fatty food intolerance. One complained primarily of constipation. One presented with indefinite pain in the lower part of the abdomen, later diagnosed as due to diverticulitis. Four had no symptoms related to any component of the triad. Thus in over 50% the chief complaint was referable to hiatus hernia. Among the symptomatic patients, the majority also had secondary complaints, suggesting at least one additional condition within the triad. One-third had many diverticula while the remainder had a moderate number. An equal frequency of large and small, multiple or few, gallstones was encountered.

Comment

Etiological Factors.—Since cholelithiasis, hiatus hernia, and diverticulosis are found together more frequently than can be expected on the basis of chance alone, it seems worth while to consider some possible etiological factors which could be common denominators. According to Muller, Saint theorized somewhat simply that constipation produced diverticula of the colon and, with continued straining at the stool, hiatus hernia developed. The gallstones were considered to form as a result of biliary stasis associated with both conditions. Palmer stated that it was difficult to hypothesize a common etiology, particularly since the individual conditions were poorly understood. However, he felt that there might be some relation between hiatus hernia and diverticulosis coli on a congenital weakness basis. He could see no relation to cholelithiasis.

TABLE 3.—*Comparison of Calculated with Actual Incidence of Triad*

Group	Patients	P Value	Cases		Times Greater Than Chance
			Calculated No.	Actual	
A	713	0.004	713×0.004=2.8	24	8.6
B	58	0.026	58×0.026=1.5	11	7

From the study of this series, the factor of age would seem to be quite important. As mentioned earlier, the average age of those presenting with the complete triad was 68. The average ages for the single conditions, cholelithiasis, hiatus hernia, and diverticulosis coli, in the over-all group were 55, 58, and 60 respectively. Fat atrophy and loss of elasticity of the tissue about the hiatal ring concurrent with aging are recognized factors in hiatus hernia.[1a] Similarly, weak spots are likely to develop in the colon wall due to tissue thinning as age advances.[10] Age hardly explains the cases encountered in younger persons, specifically by Palmer, and in these instances the matter of congenital weakness would have to be presupposed.

TABLE 4.—*Comparative Incidence of Triple and Dual Combinations*

	Cases	Incidence in 713 Patients, %
Cholelithiasis, hiatus hernia, and diverticulosis coli	24	3.4
Cholelithiasis and diverticulosis coli	23	3.2
Hiatus hernia and diverticulosis coli	19	2.6
Cholelithiasis and hiatus hernia	9	1.3
Total combinations	75	10.5

Approximately 50% of the patients with the complete triad in this series complained of long-standing constipation. Among the patients with cholelithiasis only, diverticulosis coli only, and various dual combinations (including hiatus hernia), constipation was noted in slightly less than 45%. Within the clinic population as a whole, constipation was estimated at 30%. Constipation among the patients with hiatus hernia only was but slightly greater than in the clinic population.

While these figures are not outstandingly in favor of constipation as a prime etiological factor, they are sufficiently significant for it to deserve consideration. Other authors in studying the single conditions have found constipation to be a common symptom. Willard and Bockus [11] reported constipation in 44% of their patients with diverticulosis coli. Spriggs and Marxer [12] reported slightly over 50% in the same condition. Blalock [2a] described constipation in 62% of his patients with gallstones.

It could be hypothesized that the effort of straining at stool associated with constipation might contribute to the triad. This causes increased intra-abdominal and intracolonic pressure, thus providing a mechanism for both hiatus hernia [13] and diverticulosis coli.[14] Goldman and Ivy [15] demonstrated in animal experiments that distention of colon (such as might accompany constipation) can initiate reflex stimuli to inhibit free bile flow, the corollary being that such biliary stasis can contribute to gallstone formation.

The statement was made earlier that while obesity was not necessary it was particularly common among females with the triad. This same relationship is found in females with cholelithiasis.[16] In addition to increasing intra-abdominal pressure which could promote hiatus hernia development,[2b] obesity favors the disposition of fat in the intestinal wall making it weak and more susceptible to diverticula formation under the stress of increased intracolonic pressure.[17]

Mention should be made of the fact that, since multiparous females are commonly members of the triad group, straining from childbirth may be a predisposing cause. Multiparas as a group are also known to show an increased incidence of gallbladder disease.[10]

After consideration of the various possible etiological factors, namely, age, congenital structural weakness, constipation, obesity, and multiparity, it appears that the triad does not develop in response to any single one but more likely as a result of the interaction of several of these.

Pathogenesis.—Because of the necessity of applying *post hoc* reasoning, it is difficult to reconstruct the pathogenesis of the triad. According to age averages of the individual conditions in this series, and even more so in those of other authors, cholelithiasis should develop before diverticulosis coli or hiatus hernia. Bockus[10] and Blalock[2a] recorded age averages of 42 and 44, respectively, for patients with cholelithiasis. There is general agreement in the findings of various studies[18] that hiatus hernia and diverticulosis coli are much more common after age 55.

Some support for the general proposition that cholelithiasis is the first condition to appear can be found in the postcholecystectomy group of this series. Here, the average age at the time of operation was 52, whereas the other conditions were diagnosed later at an average age of 64. It is granted that hiatus hernia or diverticulosis coli may have existed undetected during this interval, but the implication is that all conditions may not have been present at the same time. Palmer made a similar observation in some of his patients who were followed for several years with x-ray examinations.

Reference to the dual combination in table 4 helps shed some light on the matter of what condition might follow cholelithiasis, presuming this to be the initial one. Because the group with cholelithiasis and diverticulosis coli is 2.5 times larger than the group with cholelithiasis and hiatus hernia, on a chance basis, it could be expected that diverticulosis coli is more often the second entity to appear, particularly since the average age for both combinations was equal (59). It is difficult to draw any supporting inferences from other reports in the literature on this point because the number of patients having all three x-rays is not stated.

There is doubt if any patient in the group with hiatus hernia and diverticulosis coli will ever develop gallstones to complete the triad, because the factors of age and sex are against it. The average age of this group in our series was 65, and males constituted nearly 60% of their number. In contrast, the average age in both of the other possible dual combinations, previously mentioned, was 59, and over 80% in each were females. Wissmer mentioned a similar male predominance and average of 67 among his patients with hiatus hernia and diverticulosis coli.

Clinical Implications.—Awareness as to the existence of the triad has practical clinical value. This is well illustrated in Palmer's series where 16 of the 24 patients had a cholecystectomy but only one had complete relief of symptoms and 9 were unimproved. Six of these nine patients later had repair of hiatus hernia which effected a cure. Palmer aptly warns of accepting the most apparent condition, usually gallstones in his experience, as the sole cause for the patient's difficulty. The reverse of this was also true in our series, where 13 of 24 patients presented chiefly with symptoms of hiatus hernia.

Although the main clinical interest in the triad centers about cholelithiasis and hiatus hernia, it seems worthwhile to point out that in 13 of the 24 cases in our series, there was x-ray evidence of diverticulitis, namely, irritability of the colon in the region of the diverticula. While only one patient presented with clinical diverticulitis, the others are certainly potential candidates for developing the condition.

Summary

Cholelithiasis, hiatus hernia, and diverticulosis coli were found in combination in 24 patients from a group of 713 patients, each of whom had been studied by cholecystogram, x-ray series of the upper gastrointestinal tract, and barium enema. This represented an incidence of 3.4%. Another group of 58 patients who had undergone cholecystectomy were studied by an upper gastrointestinal series and barium enema, and 11 were found to have both hiatus hernia and diverticulosis coli, for an incidence of 19%. The triad occurred with a frequency considerably greater than expected from chance alone.

Age, congenital structural weakness, constipation, obesity, and childbearing were considered as contributory etiological factors. The triad is believed to develop as a result of the interaction of several of these factors. Females, particularly obese multiparas, were most susceptible in this series, but males were not exempt.

There is indirect evidence to suggest that cholelithiasis is the first condition to appear, followed by diverticulosis coli and then hiatus hernia. The finding of 75 various combinations in 713 cases completely studied indicates the value of doing all three x-ray series in patients with gastrointestinal complaints.

When a patient has a history of cholelithiasis or demonstrable hiatus hernia, particularly if he is over 60 years of age, the probability of other triad elements being present is greatly increased. Awareness as to the likelihood of the triad, particularly when one of the member conditions is found or known to exist, will aid the clinician in a more accurate appraisal of the patient's complete problem.

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References

1. (*a*) Bockus, H. L.: Gastro-enterology, Philadelphia, W. B. Saunders Company, 1950, vol. 1, p. 158. (*b*) Jones, C. M.: Hiatal Esophageal Hernia with Special Reference to Comparison of its Symptoms with Those of Angina Pectoris. New England J. Med. **225:**963-972 (Dec. 18) 1941. (*c*) Wilkinson, S. A.: Diaphragmatic Hernia: Medical and Surgical Treatment, ibid. **210:**1105-1109 (May 24) 1934.

2. (*a*) Blalock, A.: Clinical Study of Biliary Tract Disease, J. A. M. A. **83:**2057-2060 (Dec. 27) 1924. (*b*) Polley, H. F.: Congenital Short Esophagus with Thoracic Stomach and Esophageal Hiatus Hernia: Report of 47 Cases, ibid. **116:** 821-825 (March 1) 1941.

3. Muller, C. J. B.: Hiatus Hernia, Diverticula, and Gall Stones, Saint's Triad, South African M. J. **22:**376-382 (June 12) 1948.

4. Palmer, E. D.: Saint's Triad: Hiatus Hernia, Diverticulosis Coli and Gall Stones, Am. J. Digest. Dis. **18:**240-241 (Aug.) 1951.

5. Brombart, M.; Goutkine, J.; and Laurent, Y.: Les protrusions gastriques à travers l'hiatus oesophagien, Acta gastro-enterol. belg. **13:**222-244 (March) 1950.

6. Wissmer, B.: La triade hernie disaphragmatique, diverticulose, cholelithiase, Praxis **40:**396-397 (May 10) 1951.

7. Palmer, E. D.: Saint's Triad (Hiatus Hernia, Gall Stones and Diverticulosis Coli) Problem of Properly Directing Surgical Therapy, Am. J. Digest. Dis. **22:**314-315 (Nov.) 1955.

8. Pearl, R.: Introduction to Medical Biometry and Statistics, ed. 3, Philadelphia, W. B. Saunders Company, 1940. p. 311.

9. References 3, 5, and 6.

10. (*a*) Hurst, A. F., and Rowlands, R. P.: Diverticula of Colon, Guy's Hosp. Rep. **75:**462-484 (Oct.) 1925. (*b*) Reference 3.

11. Willard, J. H., and Bockus, H. L.: Clinical and Therapeutic Status of Cases of Colonic Diverticulosis Seen in Office Practice, Am. J. Digest. Dis. **3:**580-585 (Oct.) 1936.

12. Spriggs, E. I., and Marxer, O. A.: Intestinal Diverticula, Quart. J. Med. **19:**1-34 (Oct.) 1925.

13. References 1*a* and 2*b*.

14. Bockus, H. L.: Gastro-exterology, Philadelphia, W. B. Saunders Company, 1950, vol. 2, p. 674.

15. Goldman, L., and Ivy, A. C.: Effect of Distention of Colon and Stimulation of Nerve Supply on Flow of Bile from Liver, Ann. Surg. **110:**755-765 (Oct.) 1939.

16. Bockus, H. L.: Gastro-enterology, Philadelphia, W. B. Saunders Company, 1950, vol. 3, p. 595.

17. References 10*a* and 14.

18. Brick, I. B.: Incidence of Hiatus Hernia and Associated Lesions Diagnosed by Roentgen Ray, Arch. Surg. **58:** 419-427 (April) 1949. References 1*b*, 2*b*, and 12.

TECHNIQUE TO AVOID SPINAL-TAP HEADACHE

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To prevent cephalalgia after lumbar punctures certain precautions should be taken. A small needle should be used, and it should be inserted in such a way as to separate rather than cut the dural fibers, most of which run longitudinally. After the needle is removed the patient should be made to lie on his abdomen for three hours before ambulation. No. 18 needles were used and the dural fibers intentionally cut in a test group of 894 patients. They were placed on their abdomens for three hours. Cephalalgia followed in four, an incidence of less than 0.5%. The same technique was followed in a contratest group of 200 patients except that for three hours after the puncture they were kept supine. The incidence of cephalalgia in this group was 36.5%. It is assumed that assumption of the prone position staggers the punctures in the dura and arachnoid, decreases the potential epidural space, and releases the tension on the dural and arachnoidal tears; this would reduce the loss of spinal fluid. Whatever the explanation, the results were convincing.

Leakage of cerebrospinal fluid has been described by many authorities as the basic common denominator of spinal-tap cephalalgia. As a result many attempts, including adequate hydration, catgut plugs,[1] intravenously given solution of pituitary gland extract (Pituitrin), bed rest for 24 hours, intravenously given saline solution, and prepuncture sedation, have been made to prevent this leakage and its effects. None has proved entirely satisfactory.

However, without use of the above techniques, spinal-tap headache was not evident in approximately 125 patients receiving lumbar punctures performed by me during a two-year period. After the punctures, these patients were told to lie on their abdomens for three hours and then become ambulatory. This position was selected since it was believed that less leakage of spinal fluid would occur with the tap site up.

In order to determine the efficacy of this technique, a complete record was maintained for lumbar punctures performed from Sept. 30, 1954, to Nov. 20, 1957. In all, 1,094 records of consecutive patients were utilized. All taps were performed successively, but patients with known cerebral

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hypertension due to intracranial neoplasms were eliminated from the study. There were 894 patients who received lumbar punctures with use of the above technique, and 200 other patients were maintained as a control group. After lumbar puncture the patients in the control group were placed on their back for three hours and then permitted to be ambulatory.

The first 200 patients were from the Veterans Administration Hospital, Aspinwall, Pa., and the Veterans Administration Hospital, University Drive, Pittsburgh. Six hundred ninety-four were from the combined private and ward services of Dr. S. N. Rowe, J. F. Grunnagle, and A. F. Susen at St. Francis General, Western Pennsylvania, Columbia, and Presbyterian hospitals in Pittsburgh. An additional 200 patients for control were from the Veterans Administration Hospital on Leech Farm Road and the Presbyterian Hospital, Pittsburgh.

Method

Patients in both the control and basic groups were not specifically asked if they had headaches but were questioned carefully as to any discomfort they might have. Discomfort of under eight hours' duration was not recorded in the control group as cephalalgia, but any discomfort was recorded in the basic group. No attempt was made to separate data on female and male patients, and consecutive taps were recorded.

All punctures were performed with the patients in the on-side knee-chest position, and an attempt was made to keep the spinal column level by adequate cushioning. A no. 18, sharp, short, beveled needle was used in all instances, with the cutting edge perpendicular to the dural fibers in an attempt to decrease the size of the dural defect and therefore the potential for leakage.

The puncture site was at the fourth lumbar interspace in most instances. All punctures were made in the midline. After the initial pressure had been recorded, an estimated 12 to 14 cc. of cerebrospinal fluid was removed. This volume was periodically checked and found to be 13 cc. ± 1 cc.

Prone pressures for 100 patients in the control group were obtained after routine puncture, without removing fluid, by rolling the patients over on their abdomens. Prone pressures were taken with the thought that the cerebrospinal fluid pressure with the patient in the prone pressure position might be less than that in the on-side knee-chest position. In recording prone pressures, the needle measurement in millimeters from point to hub was added to the Levinson type manometer reading. When the pressure was zero or less, this measurement was recorded as the pressure. The average prone pressure as determined may, therefore, be higher than it actually should be. The first 240 spinal punctures were used to determine average spinal fluid pressure. They were done in the usual manner with the patient in the on-side knee-chest position.

Epidural Pressure

No special effort to reduce the negative epidural pressure need be made when performing a lumbar puncture. Reducing it may even be a potential hazard due to introduction of contaminated air into the epidural space. Epidural pressures were taken in 16 patients and found to vary from 0 to 286 mm of isotonic sodium chloride solution. These pressure were measured by turning the Levinson type manometer (one section) toward the floor with its tip immersed in a sterile wide-based container of isotonic sodium chloride solution. The spinal needle was attached to a three-way stopcock and advanced slowly until the epidural space was entered. None could be recorded with the patient in the abdominal position.

Negative epidural pressure is formed in the on-side knee-chest position by tensing the dura over the vertebral bodies and pulling it away from the lamina, thereby forming a void with negative pressure. This can be demonstrated by having the patient slowly extend his knees while on his side; the negative epidural pressure will then be elevated to zero and, upon flexion, will increase with increasing flexion.

During the operation for herniated nucleus pulposus with the patient in the prone position, one usually has the patient flexed. At the end of the procedure the patient is extended, thus permitting the dural sac to expand. At this point one notices that the epidural space posteriorly is obliterated by the dura coming into contact with the epidural fat and lamina of the vertebral body. In addition, one can often see the dura migrate cephalicly during extension. A roentgenogram to demonstrate the migration of the caudal dural sac during flexion is noted in the figure. When a patient is permitted to extend again, this tension is released and the dura slides back over the arachnoid, staggering corresponding points, and again it comes in closer contact with the lamina, obliterating the relative epidural space.

Findings

There were 894 on-side knee-chest position lumbar punctures performed utilizing no. 18 needles with the cutting edge perpendicular to and therefore cutting the dural fibers. Patients were rolled onto the abdomen immediately after the needle was withdrawn, and any discomfort was recorded. Only four patients (0.447%), cases 26, 539, 800, and 888, developed post-tap cephalalgia.

Two of these patients had proved expanding intracranial lesions, and in the other two patients brain tumor was suspected. The 26th and 539th patients had intracranial neoplasms and no complaint of headaches prior to the taps; they developed typical postpuncture cephalalgia. Both of these patients had normal pressures. The 26th, a 24-year-old male who had a sterile frontal abscess secondary to a gunshot wound, had post-tap cephalalgia for five days; the 539th, a 38-year-old male who had a craniopharyngioma, had postpuncture cephalalgia for six days.

A 24-year-old male (case 800), who was discharged with the diagnosis of demyelinating disease, etiology undetermined, and suspicion of brain tumor, had post-tap headache for 48 hours. The 888th patient was a 16-year-old female with a convulsive disorder of seven days' duration, and she had discomfort for five days. However, in this instance the needle was passed completely through the dural sac into the vertebral body anteriorly. The patient was discharged with the diagnosis of convulsive disorder of unknown etiology.

The 200 patients used for the control group were placed on their backs for three hours and then permitted to be ambulatory. An incidence of 36.5% postpuncture headaches occurred for this group. In 100 patients with prone pressure there was 38% cephalalgia; in 100 without prone pressure there was 35% cephalalgia. The average pressure in 240 patients in the on-side knee-chest position was 133.5 mm. of cerebrospinal fluid; the average pressure in 100 patients in prone position was 130.97 mm. The average incidence of postpuncture cephalalgia with no. 18 needles, in the literature, is 41%; the incidence in 894 patients in this study was 0.45%. The incidence of postpuncture cephalalgia in 894 patients without intracranial neoplasms was 0.22%.

Summary and Conclusions

There were 894 on-side knee-chest position lumbar punctures performed with a no. 18 needle cutting the dural fibers. The patients were then kept on their abdomens for three hours before ambulation. Four patients, an incidence of less than 0.5%, had post-spinal-tap cephalalgia. Two of the patients who developed spinal-puncture cephalalgia had proved expanding intracranial lesions, and in the other two patients brain tumor was suspected. In the control group 200 on-side knee-chest lumbar punctures with no. 18 needles were performed, and the patients were kept on their backs for three hours before ambulation. There was an incidence of 36.5% postpuncture cephalalgia in the control group as compared to the literature average of 41% with no. 18 needles.

The most important contributing factor in preventing spinal-puncture cephalalgia is the use of the prone position. This is due to vertebral axis extension and its effects on the lamina, epidural fat, dura, and arachnoid relationships.

To prevent spinal fluid leakage after lumbar puncture, the dural and arachnoid rents should be separated as soon as possible after removal of the needle by placing the patient in extension of his abdomen. In addition, extension releases the tension on the dural and arachnoid tears. A small needle should be used, and the dural fibers should be separated rather than cut, by inserting the cutting edge parallel to them to minimize the size of the dural and arachnoid tears and subsequent spinal fluid loss.

Negative epidural pressure is significant in escape of cerebrospinal fluid and is produced in the lumbar area only by flexion. This is the result of the void produced by tensing the dural sac over the vertebral bodies and is nonexistent in extension. Therefore, the incidence of spinal-puncture cephalalgia is minimal when patients are immediately placed on their abdomens after lumbar puncture. They should remain there for a period of three hours before becoming ambulatory. A patient with postpuncture syndrome should be placed on his abdomen and treated symptomatically until the symptomatology subsides.

Myelograms, *left*, patient on his back with thighs flexed at 75 degrees and legs extended, *right*, patient flat on his back with legs and thigh in anatomic position. Note distances that corresponding points have migrated.

Veterans Administration Hospital, Leech Farm Road (6).

Reference

1. Nelson, M. O.: Postpuncture Headache: Clinical and Experimental Study of Cause and Prevention, Arch. Dermat. & Syph. **21**:615-627 (April) 1930.

COXSACKIE B VIRUS INFECTION

PRESENCE OF VIRUS IN BLOOD, URINE, AND CEREBROSPINAL FLUID

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Viruses of the Coxsackie groups are so named because they were first isolated in 1948 from stools of children living in Coxsackie, N. Y. The viruses are characterized by their physical and biological properties, especially those of producing disease in suckling mice.[1] On the basis of the pathological lesions produced in mice and antigenic composition, the viruses are divided into two groups. Group A Coxsackie viruses induce flaccid paralysis and marked muscle degeneration in suckling mice but no significant central nervous system lesions. All members of this group, now numbering over 20, share common complement-fixing antigenic components. A few types of group A viruses have been associated with herpangina in man, and recently some cases of herpangina have been accompanied by parotitis. Certain types of group A have been associated with acute aseptic meningitis, and type 7 has been shown to produce poliomyelitis-like lesions in monkeys. This type is identical to Russian poliovirus type 4 isolated from stools of Russian children during the acute phase of a clinical illness characteristic of paralytic poliomyelitis.[2]

As opposed to this, viruses of group B in suckling mice tend to cause encephalomyelitis, pancreatitis, focal myositis, and fat necrosis. Only five types of group B are distinguished serologically. In man, infection by group B Coxsackie viruses may induce epidemic pleurodynia or myalgia or in infants an acute encephalomyocarditis.[3] Sporadic infections have been associated with an acute febrile disease which is occasionally accompanied by headache, pleuritic chest pain, testicular pain, diphasic fever curve, pericarditis, or nuchal rigidity. In addition, Coxsackie B viruses are one of the commonest causes of aseptic meningitis, some cases of which may be accompanied by minimal muscle weakness.

The diagnosis of Coxsackie virus infection is usually made by the isolation of the virus in either suckling mice or appropriate tissue culture from stool or anal swab specimens. The presence of infection is confirmed serologically by the demonstration of a rise in virus-neutralizing antibodies occurring during the illness as measured in the serums during the patient's acute and convalescent stages. Somewhat less frequently, virus can be isolated from swabs of the throat.

A 40-year-old male biochemist had an intermittent fever over a period of nine days. The only significant symptoms were malaise, chilliness, sweating, headache, myalgia, and minimal stiffness of the neck. The results of laboratory tests differed but little from the normal, except that the urinary excretion of phenolsulfonphthalein was consistently delayed. Since the patient had been working with viruses for four years, inoculations were made into monkey kidney tissue cultures and HeLa tissue cultures, using specimens of blood, urine, and cerebrospinal fluid as well as swabs from throat and anus. Intraperitoneal and intracerebral inoculations were also carried out in mice. The specimens of urine were prepared for inoculation by a concentration technique. The organism was identified as a Coxsackie B virus, and it appeared in a urine specimen collected on the fourth day of illness. It was also found at various times in the blood, cerebrospinal fluid, and pharyngeal and anal swabbings. Its appearance in the urine suggests viral infection of the kidney as the probable cause of the retention of phenolsulfonphthalein.

Although there have been only a few reports[4] of the presence of Coxsackie virus in the cerebrospinal fluid (viraliquoria) at the present time virus can be recovered from the cerebrospinal fluid of a low percentage of patients with otherwise proved Coxsackie viral meningitis. (We have used and propose the term viraliquoria as a term of convenience to indicate the presence of virus in the cerebrospinal fluid. We prefer viraliquoria to viralrrhachia as it seems more important to us to emphasize the relationship of virus to fluid rather than to spine.) We have been able to find only three reports of the presence of Coxsackie B virus in blood (viremia), and in only one of these instances[5] was the isolation associated with disease. We know of one previous report[6] of the presence of Coxsackie B virus in human urine (viruria[7]).

In this paper will be described clinical and laboratory studies of a patient with infection by Coxsackie virus, group B, type 3, from whom virus was

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cultured at varying times from blood, urine, cerebrospinal fluid, and swabs of the throat and anus. These isolations will be correlated with the clinical course of the patient and their implications discussed.

Methods

Specimens from a patient were examined in one or both of two virology laboratories. The methods used in each laboratory have already been described[8] except as specifically noted below. All specimens were inoculated into monkey kidney tissue culture, and most specimens were inoculated into HeLa cell tissue culture. Most specimens were also inoculated intraperitoneally (0.04 ml.) and intracerebrally (0.02 ml.) into Swiss white mice of less than 24 hours of age. The specimens of urine were prepared for inoculation by a concentration technique developed in one of the laboratories. This method will be reported in detail elsewhere.[9]

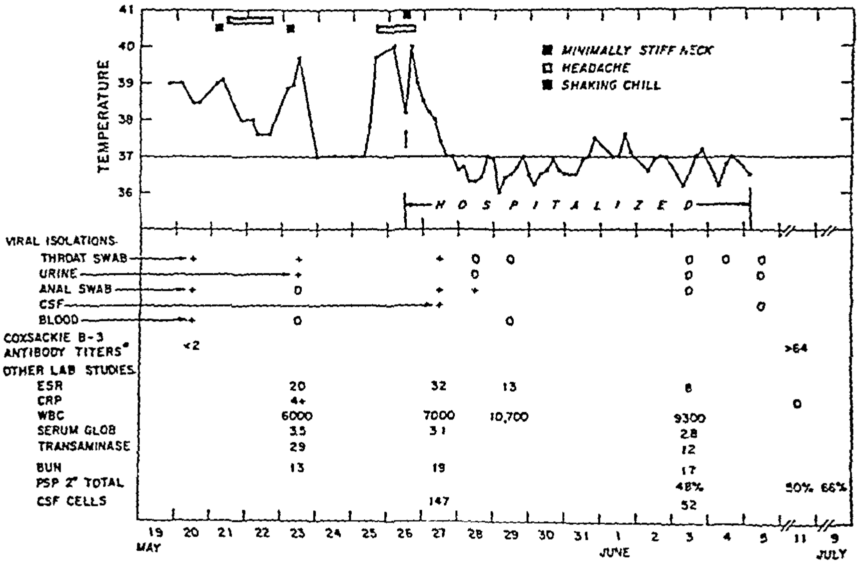
Report of a Case

A 40-year-old male biochemist had been working with a variety of viruses for four years prior to the onset of illness. From April 25 to May 9, 1957, he had been intermittently studying strains of Coxsackie B3 virus. Although no laboratory accident was known to have occurred, there was ample opportunity for exposure to infectious virus. On May 19, 1957, an illness developed characterized by malaise; myalgia, especially of the lower extremities; fever, with temperature elevation to 39 C (102 F), chillness; and sweating. Onset of illness followed two to three hours' work in a drizzling rain. The next day, May 20, the patient's temperature was still elevated at 38.5 C (101 F); he was examined, and cultures were taken. On physical examination the patient appeared acutely ill, and there was minimal tenderness on fist percussion in the right costovertebral area. On May 21 he had a shaking chill and began to have moderately severe generalized headache. On May 23, he had another shaking chill lasting about 30 minutes, he was examined, and cultures were taken again. Physical examination on this date disclosed tonsillar enlargement, grade 2, and palatal and pharyngeal erythema. Fist percussion of the lower right side of the thorax laterally produced mild abdominal discomfort. The edge of the spleen was felt 2 cm. below the left costal margin. The patient appeared acutely ill, and hospitalization was recommended. However, he felt so much better during the afternoon of that date and during the next two days that admission to the hospital was deferred.

On the evening of May 25, the patient noted the return of fever and headache. On the morning of May 26, his temperature reached 40 C (104 F), and he was admitted to the Clinical Center of the National Institutes of Health. With this illness there was no nausea; diarrhea; chest or abdominal pain; eye, ear, nose, or throat complaints; change in mental status; urinary tract symptoms; or subjective stiffness of the neck. He had been treated symptomatically with acetylsalicylic acid; no antimicrobial drugs had been given. The temporal relationship of symptoms to temperature elevations are shown in the figure.

Physical examination at the time of admission to the Clinical Center disclosed a febrile, acutely ill man. The pulse was 84 per minute, temperature 38.2 C (100.8 F), and blood pressure 125 mm. Hg systolic and 80 diastolic. The pharyngeal mucosa was slightly less reddened than previously, and there was minimal nuchal rigidity. The neurological examination was otherwise negative, and the other physical findings were the same as those on May 23.

Laboratory studies showed a hemoglobin level of 14.5 Gm. per 100 ml. and a leukocyte count of 6,000 per cubic millimeter, with 65% neutrophils, 29% lymphocytes, 4% monocytes, and 2% eosinophils. The erythrocyte sedimentation rate was 20 mm. per hour (Westergren). The C-reactive protein value was 4+. The blood urea nitrogen level was 13 mg. per 100 ml. The total serum protein level was 6.8 Gm., serum albumin level 3.3 Gm., and serum globulin level 3.5 Gm. per 100 ml. The serum bilirubin and serum alkaline phosphatase levels and cephalin flocculation, thymol turbidity, and serum glutamic oxalacetic transaminase values were normal. The results of standard urinalysis were normal. Cumulative phenolsulfonphthalein excretion was 18% at 15 minutes, 34% at 30 minutes, and 48% at 120 minutes. Cerebrospinal fluid, removed under an initial pressure of 170 mm. H_2O, was slightly cloudy and contained 147 leukocytes, all of which were lymphocytes. The cerebrospinal fluid glucose level was 57 mg. per 100 ml. (Nelson-Somogyi method), protein level 49 mg. per 100 ml. (Ling tyrosine method), and chloride level 120 mEq. per liter. Smears and cultures for fungi, bacteria, and mycobacteria were negative. The chest roentgenogram showed no change from previous films. The results of some of these laboratory studies and the subsequent determinations on the abnormal and significant tests are shown in the figure.



Relationship of viral isolation to clinical illness and laboratory studies. (*Figures for Coxsackie B3 antibody titers represent reciprocals of serum dilutions neutralizing 100 TCID$_{50}$.)

During the first 36 hours of hospitalization the patient's temperature returned to normal and remained so throughout his stay. Concurrently the symptoms of malaise and myalgia disappeared. After the second lumbar puncture, June 3, the patient was gradually ambulated. He continued to complain of easy fatigue for a period of approximately three weeks after onset of illness, after which he has remained entirely asymptomatic.

Results of Viral Cultures

The results of tissue culture and suckling mice inoculation are shown in the table. A specimen was marked as positive after it had been found to contain virus by either isolation technique in either or both laboratories. The relationship of viral isolation to clinical illness and laboratory studies is shown in the figure. Virus was recovered from the blood only early in the illness and, in this case and one other,[5] five to six days prior to the appearance of clinical findings of meningitis. Virus was isolated from throat and anal swabs both early and relatively late in the illness. No viral isolations were made after the patient had been afebrile 24 hours (May 28).

Comment

The illness in this patient was characterized by fever which occurred over a period of nine days and was accompanied by only a few other symptoms. The symptom and finding that pointed to localized disease were the headache and the minimally stiff neck. The history of exposure and the biphasic course of fever which we have observed in a number of other patients with Coxsackie infections were the only aspects of the illness prior to hospitalization that suggested infection by Coxsackie B virus. It is worthy of note that during the 36-hour period prior to admission during which fever was absent the patient felt that he had recovered, and he was able to engage in vigorous physical activity.

Coxsackie B3 Isolations in Tissue Cultures and Suckling Mice

		First Laboratory		Second Laboratory	
Date, 1957	Specimen	Tissue Culture	Suckling Mouse	Tissue Culture	Suckling Mouse
5/20..........	Throat swab	+	+	...	...
	Anal swab	0	+	...	...
	Blood	+	+	...	...
5/23..........	Throat swab	+	+	+	...
	Urine	...	...	+	0
	Anal swab	...	...	0	...
	Blood	...	...	0	...
5/27..........	Throat swab	0	0	+	...
	Anal swab	...	...	+	...
	Cerebrospinal fluid	0	0	+	...
5/28..........	Throat swab	0	...	0	...
	Urine	0	...	0	0
	Anal swab	+	...	+	+
5/29..........	Blood	0	...	0	...
	Throat swab	...	...	0	...
6/3..........	Throat swab	0	...	0	...
	Anal swab	0	...	0	0
	Urine	0	...	0	0
6/4..........	Throat swab	...	...	0	0
6/5..........	Throat swab	0	...	0	0
	Urine	0	...	0	0
	Cerebrospinal fluid	0	...		

Laboratory studies during the course of illness in general yielded results that were minimally abnormal. The leukocyte count was normal during the period of fever and reached a value of 10,700 per cubic millimeter on the 11th day of illness only. The erythrocyte sedimentation rate increased to 32 mm. per hour. The serum globulin level of 3.5 Gm. per 100 ml. declined to 2.8 by the 16th day of illness. Although the serum transaminase level fell from 29 to 12 units, both values were within the range considered normal for the Clinical Center laboratory.

The urinary excretion of phenolsulfonphthalein was, however, delayed. The cumulative total excretion two hours after injection of the dye was 48 and 50% on June 3 and June 11 respectively. These values, as well as the percentage of the dye excreted 15 minutes after injection (18 and 16%, respectively, on these dates), were below the minimal figures found in normal subjects.[10] The cumulative excretion of dye 15 minutes and two hours after injection on July 9 and Oct. 10, although below average, was within the range of minimal values. Prior to this abnormal phenolsulfonphthalein excretion value there had been no history of acute or chronic renal disease. Blood urea nitrogen levels and the results of urinalyses of single morning specimens on the 5th, 11th, and 24th day of illness were normal. Viruria however, did occur.

Viruria in man was first reported by Jonesco,[11] in 1927, in rabies infection. In 1938 Lepine and Sautter [12] reported the presence of lymphocytic choriomeningitis virus in urine. Russian spring-summer virus has been found in urine of patients, according to Smorodintseff.[13] Howitt,[6] in 1950, reported the recovery of a virus of the Coxsackie group from one specimen of urine. No details of the case were given. Weller and others,[7] in 1956, isolated virus from urine of two patients with illnesses resembling that of cytomegalic inclusion disease. Utz and others [14] isolated mumps virus from the urine of six patients with an illness clinically characteristic of mumps. In addition, viruses have been recovered from the urine of animals naturally or artificially infected with the following diseases: foot and mouth disease, canine distemper, equine infectious anemia, psittacosis, feline infectious enteritis, cattle plague (rinderpest), and African horse sickness. Despite viruria in each of the above infections, the presence of virus in urine is not suspected usually, and urine is not listed [15] as a specimen to be studied in the diagnosis of any viral disease in man.

Certain difficulties have been encountered in the search for virus in urine. It has been observed [14] that mumps virus could not be isolated from specimens of urine that had remained for a number of hours at room temperature or that had been frozen and thawed. Urine had previously been observed [6] to have a toxic effect on the cells of tissue cultures. It was found necessary to make a tenfold dilution o urine in saline solution prior to its inoculation int tissue culture tubes. The detrimental effect on viru and the necessity for dilution of the specimen prio to inoculation may have been factors in the pas that reduced the chance of obtaining virus fron urine specimens.

How can the presence of virus in urine be ac counted for? One possibility might be that virus present in urine as a result of "spill over" fro blood. In the case of this particular patient, hov ever, no virus could be detected in a specimen blood obtained approximately five minutes prior to the collection of the positive urine specimen.

Another possibility is that the virus was present in blood but masked by antibodies. With filtration through the glomerulus, dissociation of the virus-antibody combination may have occurred. In support of this is the observation[16] that there is at least a thousandfold difference in the amount of potential antibody (globulin) material present in blood and urine.

A third possibility is that there were so few infecting virus particles in the blood that they could only be demonstrated after concentration of glomerular filtrate and virus in the renal tubules. To investigate this possibility, twofold serial dilutions were made of the original suspension of material obtained by high-speed centrifugation of urine. This specimen by this time had undergone two *freezings and thawings. Studies of this specimen* revealed that there were at least 10 but less than 20 tissue-culture infective particles per milliliter of original urine. This low figure would appear to be compatible with the possibility that extremely small amounts of virus in blood were concentrated and detected in the urine.

A fourth explanation is that a virus was propagating in the cells of the urinary tract, especially those of the kidney. The evidence that monkey and human kidney cell tissue cultures are excellent mediums for the growth of many viruses supports this possibility. In addition, monkey kidneys obtained for tissue culture are occasionally infected or contaminated by (simian) viruses.[17] It is recognized, however, that such tissue cultures bear little resemblance histologically and physiologically to the intact kidney.

Microscopic lesions have been seen in kidneys from patients who had had various viral diseases including poliomyelitis, influenza, mumps, measles, infectious hepatitis, chickenpox (varicella), epidemic (St. Louis type) encephalitis, yellow fever, and cytomegalic inclusion disease. Abnormal results of urinalyses and other tests of renal function during clinical illness have further suggested to clinicians that the kidney may be involved in a number of viral infections. Recently, Bates and co-workers[18] have speculated that a virus may be the cause of some cases of acute nephritis unrelated to group A hemolytic Streptococcus. The isolation from urine of the viruses already mentioned, and the suggestion of concurrent abnormal renal function in our patient, again raises the possibility of viral infection of the kidney and damage to the kidney by virus. From these considerations it would seem that the hypothesis of renal viral disease is of both long standing and recent interest and needs further investigation.

Summary and Conclusions

A patient became ill with an aseptic meningitis syndrome and infection with Coxsackie virus, group B, type 3. During the course of this illness one test of renal function was consistently abnormal. Virus was present in the anal swab, throat swab, blood (viremia), cerebrospinal fluid (viraliquoria), and urine (viruria). There are several possible mechanisms by which the virus may have been excreted in urine. The presence of virus in urine and abnormal renal function studies should lead to a consideration of the hypothesis of renal viral disease.

References

1. Dalldorf, G : Coxsackie Viruses, Ann Rev. Microbiol. **9**:277-296, 1955.

2. Habel, K., and Loomis, L N.: Coxsackie A7 Virus and Russian Poliovirus Type 4, Proc. Soc Exper. Biol. & Med **95**:597-605 (July) 1957.

3 Kibrick, S., and Benirschke, K : Acute Aseptic Myocarditis and Meningoencephalitis in Newborn Child Infected with Coxsackie Virus Group B, Type 3, New England J. Med. **255**:883-889 (Nov. 8) 1956

4 Rhodes, A. J., and Beale, A J.. Aseptic Meningitis: Evidence for Etiologic Role of Coxsackie B and Orphan Viruses, Ann New York Acad Sc **67**:212-222 (April 19) 1957. Reference 1.

5. Shelokov, A., and Habel, K.. Viremia in Coxsackie B Meningitis, Proc. Soc. Exper Biol & Med **94**:782-784 (April) 1957.

6. Howitt, B. F.: Recovery of Coxsackie Group of Viruses from Human Sources, Proc Soc Exper Biol & Med **73**:443-448 (March) 1950

7. Weller, T. H , Macauley, J C , Craig, J. M., and Wirth, P.: Isolation of Intranuclear Inclusion Producing Agents from Infants with Illnesses Resembling Cytomegalic Inclusion Disease,' Proc Soc Exper., Biol. & Med **94**:4-12 (Jan) 1957.

8. (*a*) Utz, J. P., Parrott, R H , and Kasel, J A . Diagnostic Virus Laboratory for Clinical Service, J A M A. **163**:350-352 (Feb 2) 1957. (*b*) Reference 5

9. Utz, J. P., and others. Clinical and Laboratory Studies of Mumps. II. Duration of Excretion of Virus in Urine, Proc Soc. Exper. Biol & Med , to be published

10 Syllabus of Laboratory Examinations in Clinical Diagnosis. Critical Evaluation of Laboratory Procedures in Study of Patient, edited by T. H. Ham, Cambridge, Mass , Harvard University Press, 1952

11. Jonesco, D Virulence de l'urine dans la rage humaine, compt. rend. Soc de Biol **97**:1731-1733 (Jan 4) 1928

12. Lepine, P., and Sautter, V Contamination de laboratoire avec le virus de la choriomeningite lymphocytaire, Ann. Inst. Pasteur **61**:519-526 (Nov) 1938

13. Smorodintseff, A. A Spring-Summer Tick-Borne Encephalitis, Arch Ges Virusforsch. **1**:468-480, 1940.

14 Utz, J. P , and others. Clinical and Laboratory Studies of Mumps. I Laboratory Diagnosis by Tissue-Culture Technic, New England J Med **257**:497-502 (Sept 12) 1957

15 Viral and Rickettsial Infections of Man, edited by T M Rivers, ed. 2, Philadelphia, J. B Lippincott Company, 1952

16 Rigas, D. A., and Heller, C G . Amount and Nature of Urinary Proteins in Normal Human Subjects, J. Clin. Invest **30**:853-861 (Aug) 1951.

17. Hull, R. N., and Minner, J. R.: New Viral Agents Recovered from Monkey Kidney Cells: II. Problems of Isolation and Identification, Ann. New York Acad. Sc. **67**:413-423 (April 19) 1957.

18 Bates, R. C., Jennings, R. B., and Earle, D. P.: Acute Nephritis Unrelated to Group A Hemolytic Streptococcus Infection: Report of 10 Cases, Am. J. Med **23**:510-528 (Oct.) 1957.

EXPERIENCE WITH A COMMUNITY HEALTH COUNCIL QUESTIONNAIRE FOR PRACTICING PHYSICIANS

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A questionnaire provided a means whereby participating physicians could and did report on the health and welfare needs of persons who came to them for medical care. The greatest unmet needs for services or facilities in San Francisco were alcoholism; other mental illness or emotional disturbance; paralytic conditions (other than poliomyelitis), including those resulting from strokes; arthritis and rheumatism; cancer; and mental retardation. The response to the questionnaire indicated an unexpected degree of interest on the part of physicians. The medical profession as a whole is seldom able to fulfill completely its traditional and ideal role of serving as physician to the community in guiding and directing all health activities. Much of the planning and many of the research, educational, and service functions in the field of community health are now recognized as responsibilities of the public and voluntary health and welfare agencies.

Modern urbanization has given rise to complex methods of dealing with community health problems. No longer is the practicing physician who serves the individuals in an area also able to perform effectively the additional duties of physician to the community as a whole. Problems of general community health have often been left to the various public and voluntary health services which have arisen to meet these needs. The funds to support these organized activities derive from government subsidies and from voluntary contributions to the national and local health and welfare agencies. Their personnel consists of individuals paid by the government and by voluntary agencies and of countless public-spirited volunteers who willingly and enthusiastically work in areas of their special interests or for the general health and welfare of the community. Many physicians, as individuals, serve these agencies in advisory or service capacities, but the medical profession as a whole is seldom able to fulfill completely its traditional and ideal role of serving as physician to the community in guiding and directing these activities. As a result, much of the planning and many of the research, education, and service functions in the field of community health are now recognized as responsibilities of the public and voluntary health and welfare agencies.

The Health Council of the United Community Fund of San Francisco is composed of over 200 individuals drawn from the medical profession and from the community. The members of the council serve on the board of directors or in an executive capacity in a public or voluntary health agency or have a special interest in the health needs of the community. In 1956, the Health Council undertook a broad two-year survey (1) to identify and analyze health and rehabilitation needs in San Francisco, (2) to ascertain what public and voluntary services are available to meet these needs, (3) to determine on the basis of informed opinion the gaps in service, the barriers to utilization of existing services, and the need for modification or strengthening of services, and (4) to involve those persons who can contribute their knowledge and experience to this study and help mobilize community effort to carry out its recommendations.

Recognizing the fundamental role of the practicing medical profession in community health, the Health Council, in conjunction with the San Francisco Medical Society, developed a four-page questionnaire for the purpose (1) of ascertaining the experience of practicing physicians in relation to community health problems and (2) of determining the degree of participation of practicing physicians in community health activities. The results of the survey are summarized in this report.

The Responses

The response to the questionnaire indicated an unexpected degree of interest on the part of the doctors. The questionnaire was sent to 1,579 physicians, of whom 838 (53%) responded. This report, however, is based on only 801 returns; the answers of 24 physicians who participated in pretests were omitted, as were 13 responses received after the results were tabulated. Among the doctors participating, general practice and the specialties were

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proportionately represented according to a survey by the San Francisco Medical Society of its members in 1954. Over 86% of the respondents were self-employed; approximately 5% were employed by the government. Many of the self-employed physicians also had part-time private or governmental employment.

Physicians' Assessment of Needs and Services.—Some of the more significant questions asked and a tabulation of the most frequent answers by the physicians participating in the survey are listed here.

QUESTION: In the past month has any patient in your care needed services, irrespective of whether the service was secured, other than the diagnosis and treatment which you provide?

Ninety per cent of the physicians indicated a need by patients for one or more such services. The most frequently noted services, with the percentage of doctors noting the need, are as follows: psychiatric diagnosis and treatment, 62.2%; physical therapy, 56.5%; financial aid, 48.2%; home nursing, 47.0%; and long-term institutional care, 36.4%.

QUESTION: In the past month have you referred any patient to any of the following for information about services or to secure such services?

A number of health and welfare agencies were listed. Seventy-nine per cent of the physicians reported referrals to one or more agencies. The most frequently used agencies and the percentage of respondents reporting referrals are as follows: Department of Public Health, 42.6%; Visiting Nurse Association, 38.3%; psychiatric clinics, 35.3%; Veterans Administration, 30.9%; State Department of Employment, 17.3%; family service agencies, 16.7%; and State Bureau of Vocational Rehabilitation, 14.2%.

QUESTION: Taking into consideration the varied medical, psychosocial, and vocational aspects of rehabilitation, and in the light of your experience and observation, select and list below three conditions where there appears to be the greatest unmet needs for services or facilities in San Francisco.

Nineteen illnesses or conditions were listed, and an additional space for "write-in" was provided. Items checked by more than 10% of the participants included the following categories: alcoholism, 45.8%; other mental illness or emotional disturbance, 35.6%; paralytic conditions (other than poliomyelitis), including those resulting from strokes, 28.6%; arthritis and rheumatism, 16.5%; cancer, 14.2%; and mental retardation, 12.1%.

QUESTION: Considering each aspect of rehabilitation, and in the light of your experience and observation, in which areas does it seem that sufficient services are available to San Franciscans with serious illnesses or conditions of a handicapping nature?

A check list was provided to indicate "more services needed," "sufficient services available," or "don't know." The highest number of doctors checked "more services needed" for the following items, in this order: (1) hospitals for the chronically ill or long-term patient, (2) nursing home or convalescent home care, (3) psychiatric diagnosis or treatment, (4) social and recreational opportunities for the aging, (5) home nursing, and (6) psychological testing and counseling.

QUESTION: What do you regard as the two or three top priorities to which our community ought to give more attention in health promotion and care?

Fifty-two per cent of the respondents offered suggestions. The most frequent were mental health, excluding alcoholism, 50.8%; alcoholism, 28.1%; care and rehabilitation of the chronically ill and physically handicapped, 22.5%; and the problems of the aged, 20.6%.

Participation of Practicing Physicians in Community Health and Welfare Activities.—Seventy-three per cent of the doctors who responded were currently giving volunteer service on the staff of a hospital or clinic which provided free or part-pay care. Twenty-two per cent of the respondents were serving as board members or in an advisory capacity in a voluntary health or welfare agency. Nine per cent reported similar service with governmental agencies.

Limitations of the Questionnaire

Although the percentage of respondents was relatively high for a mailed questionnaire of this type, there is undoubtedly an element of self-selection which differentiates respondents from nonrespondents. On many points, such as the number of services connected with rehabilitation, the number of "don't know" answers was relatively high. This is probably related to the nature of certain types of practice which do not require familiarity with such services. It was often difficult to determine whether the respondent was reporting on matters familiar or unfamiliar to him. The quantitative data are only estimates and based on recall. The research intrument did not lend itself to obtaining important demographic and epidemiologic data. A "built-in bias" was evident in the relative ease with which respondents answered questions where a check list was provided, compared with their difficulty with open-ended questions which gave an opportunity to include additional material not suggested by a check list.

Usefulness of the Questionnaire

The questionnaire provided a means whereby the participating physicians could and did report on the health and welfare needs of individuals who came to them for medical care. Their experience and informed opinion made an invaluable contribution to an over-all assessment of community health needs and resources. An analysis of the "don't know" answers will provide useful material for professional education, for schools of medicine, public health, nursing, and social welfare, and for health education of the public. It is anticipated that the results of the questionnaire will serve as a stimulus for further programs of research, education, and service in the areas of greatest need in San Francisco, which the physicians emphasized by their overwhelming concern with mental health, alcoholism, care and rehabilitation of the chronically ill, and the problems of the aged. Finally, the questionnaire served as a medium for the medical profession as a whole to play its traditional role of physician to the community through active participation in a program of health and welfare planning.

Summary

An experience with a community fund health council questionnaire for practicing physicians involved a questionnaire, developed with the cooperation of the San Francisco Medical Society, which was completed by 838 (53%) of the 1,579 practicing physicians in San Francisco to whom it was submitted. An assessment of local health and welfare needs and services by practicing physicians has been made available to the planning group of the United Community Fund of San Francisco and other interested agencies. Seventy-three per cent of the physicians reported giving volunteer service on a staff of a hospital or clinic which provides free or part-pay care to patients. Twenty-two per cent have served on the board of directors or in an advisory capacity in a voluntary health or welfare agency.

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Copies of the questionnaire submitted to the doctors and a 24-page summary and interpretation of the data, entitled "San Francisco Doctors Report on Community Needs and Resources in Health and Rehabilitation," February, 1958, are available for $1.00 from the United Community Fund of San Francisco, 2015 Steiner St., San Francisco 15.

CLINICAL NOTES

CYCLIC NEUTROPENIA IN A FATHER AND DAUGHTER

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and
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Cyclic neutropenia was first reported by Leale[1] in 1910. In 1946, Reimann and de Berardinis[2] collected 13 cases from the literature, reported 1 of their own, and briefly abstracted two others which were previously unpublished. One of the latter is reported here in more detail.

Thirteen case reports[3] other than the 16 summarized by Reimann and de Berardinis have appeared in the literature. In none of these has there been any evidence of this entity appearing in more than one member of the family. The subject of this report is two cases of cyclic neutropenia occurring at a young age in a father and daughter.

Report of Cases

Case 1.—A boy was first seen in 1941 at the age of 14 years. His family stated that he had had furunculosis at the age of 6 weeks and [illegible] pneumonia at 18 months. Since the age of 2 years [illegible] roats" had occurred, associated with ulceration of the oral and pharyngeal mucous membrane, fever, and irritability. "Boils" on the skin were also reported as occurring during some of the episodes of mucous membrane lesions. The family history was noncontributory, and there was no history of allergy in the patient or his family.

Physical examination revealed no lymph node enlargement; the liver and spleen were not palpable. Granular swollen gums were present. During the period of observation, from September, 1941, to February, 1942, neutropenia appeared at intervals of 18 to 21 days, except that on one occasion the expected episode did not occur. Unfortunately, no blood cell count was obtained at this time, so it could not be determined whether there was an asymptomatic neutropenic period or a skipping of the period. During the attacks the white blood cell count ranged from 3,600 to 4,850 per cubic millimeter, with almost complete absence of neutrophils, and monocytes 18 to 36% (table 1). No anemia or thrombocytopenia was observed.

Bone marrow examination was performed on Oct. 17, 1941, at which time the white blood cell count was 4,350 per cubic millimeter, with no neutrophils seen in the peripheral blood. The marrow appeared hypocellular, and there was nearly complete absence of the neutrophilic granulocytic series, with myeloblasts, 2%; progranulocytes, 7; myelocytes: neutrophils, 1, eosinophils, 2, and basophils, 1; metamyelocytes, 2; band cells, 1; segmented cells: neutrophils, 1, and eosinophils, 5; lymphocytes, 70; and monocytes, 8; and with rubricytes, 2, and metarubricytes, 20 per 100 leukocytes.

Further blood cell counts were not obtained, since the patient lived at some distance from Chicago and his family was not cooperative about obtaining counts at a local hospital.

The patient was next seen in May, 1957, at which time he stated that the episodes of fever and oral ulcers had gradually become milder and less frequent and had ceased entirely at the age of 18 years. He had been well while

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serving in the Army for several years, except for an abscess under the left jaw which was drained No mention of the blood cell count was made to him at that time Physical examinations twice yearly by his own physician had been normal On May 21, 1957, the hemoglobin level was 15 5 Gm per 100 cc, the white blood cell count 7,250 per cubic millimeter, and the differential count as follows: segmented neutrophils, 68%, eosinophils, 2, basophils, 1, lymphocytes, 19, and monocytes, 10 The platelets appeared normal, and the red blood cells revealed only slight anisocytosis Findings on an electrophoretic study of serum proteins were normal

TABLE 1.—*Differential Blood Cell Count of Patient in Case 1 When First Seen*

Date	Symptoms	White Blood Cells per Cu Mm	Neutrophils %		Monocytes, %
			Segmented	Band Cells	
9/30/41	+		1	0	33
10/ 4/41	.		24	4	6
10/17/41	+	4 350	0	0	36
10/29/41			3	6	0
11/ 5/41		3 600	10	4	0
11/ 8/41	+				0
11/12/41	..	5 880	9	0	18
11/21/41		8 100	45	[illegible]	9
12/ 8/41	.	6 250	43	3	3
12/21/41	+				
1/ 9/42	+	4 800	0	0	30
1/17/42	.	6,700	41	8	7
1/28/42	+				

CASE 2.—A 26-month-old girl, seen on May 21, 1957, was the daughter of the patient reported on above She had had a normal birth but at the age of 3 months began to have fever, melena, and vomiting, followed by a prolonged episode of diarrhea An abnormality of the white blood cell count was said to have been noted at that time Episodes of fever occurring "once or twice a month" began at the age of 7 months At 10 months she began to have recurrent episodes of furunculosis, with or without fever, at two-week intervals These continued to the time of her first visit The father felt that the cyclic episodes were similar to those he had experienced as a boy

Physical examination revealed a well-developed child weighing 26 lb (11 8 kg) There were no enlarged lymph nodes, and the liver and spleen were not palpable Many indurated pustules were present on the buttocks

Serial blood cell counts with the cyclic occurrence of symptoms are recorded in table 2 It appears that episodes of severe neutropenia occurred at 14-day intervals The patient's serum, drawn during the neutropenic phase, was tested for agglutinins against normal leukocytes by the method of Dausset, none were found Electrophoretic studies of the serum revealed a normal pattern The patient's local physician was advised to administer benzathine penicillin G prophylactically The parents were unwilling to have further diagnostic studies done and did not return to their family physician for care.

The two cases of cyclic neutropenia presented are those of a father and daughter, each with onset during childhood No etiological factor could be found. The father has had a complete remission

Comment

Cyclic neutropenia consists of regularly occurring episodes of neutropenia, usually accompanied by ulcers of the oral mucous membrane, fever, and malaise and sometimes by infections, arthralgia, and nausea and vomiting. The periodicity of the neutropenia is one of the most striking features, with episodes occurring at intervals close to multiples of 7 days, most commonly every 21 days. A patient cited by Reimann and de Berardinis [2] and our patient in case 2 showed a 14-day periodicity.

The etiology of this syndrome is unknown. Urinary hormone studies in some patients have revealed cyclic variations in gonadotropin and/or estrogen excretion corresponding to the neutropenic cycles,[4] while other patients show no such pattern.[5] In some adult females the neutropenic cycles have been correlated with the menstrual cycle,[6] while in others this has not been the case.[7] In one of the former groups,[3b] hysterectomy and bilateral oophorectomy failed to alter the neutropenia.

The serums of two patients with cyclic neutropenia have been injected into normal individuals [8] or into guinea pigs [3c] without evidence of a neutropenic response. Splenectomy performed in 11 patients [9] was followed by improvement of symptoms and neutropenia in some, but no complete remissions were observed. Leukoagglutinins could not be demonstrated in our patients, even during a neutropenic episode (case 2). Page and Good [3m] noted similar findings Hypogammaglobulinemia has been demonstrated in only one patient [3l], a normal serum protein electrophoretic pattern was seen in our patient in case 2 when serum drawn during the neutropenic phase was so examined.

Therapy in these patients has had little effect on the neutropenia In several cases antibiotics and sulfonamides have relieved symptoms and signs of infection. Adrenocortical steroids have produced relief of symptoms and partial relief of the neutropenia in one case [3h] but were ineffective in four others.[10]

Only a few patients with this syndrome have been observed for long periods. The patient in Leale's original case [11] showed persistence of the episodes for more than 30 years. Cobet and Schilling's [3e] patient was followed for six years and that of Rolland and Davidson [12] for seven and one-half years, both with persistence of cyclic neutropenia Four patients died of infection [13] The present report (case 1) indicates that prolonged remission or spontaneous recovery may occur in these individuals

TABLE 2.—*Differential Blood Cell Count of Patient in Case 2*

Date	Symptoms	White Blood Cells per Cu Mm	Neutrophils, %		Monocytes, %
			Segmented	Band Cells	
5/21/57	—	4,700	8	0	12
6/ 7/57	—	6 400	0	0	0
6/14/57		6 100	28	0	0
6/21/57	—	6 000	7	1	1
6/28/57		6 200	22	0	0

Reports have appeared in the literature from time to time of various periodic diseases, i. e., syndromes of regularly occurring symptoms, such as fever, abdominalgia, or arthralgia. In some of these a familial tendency has been noted; Reimann [14] found periodic abdominalgia in related individuals of Armenian or Jewish ancestry, and he reported this syndrome in triplets. Bouroncle and Doan[15] studied a family of Dutch extraction in which periodic fever occurred in members over five generations. Periodic arthralgia in 23 members of the same family has also been noted by Reimann.[14]

The two cases presented here suggest a hereditary factor in the etiology of cyclic neutropenia. Only one previous report has included specific information about the parents of a patient with this disorder; Vahlquist, cited by Reimann and de Berardinis,[2] noted moderate leukopenia without neutropenia in the asymptomatic father of his patient; the mother had normal granulocytic values. Several reports[16] have indicated that no symptoms suggestive of cyclic neutropenia had been present in the family.

Summary

A 29-year-old male was first seen at the age of 14 years with cyclic neutropenia, occurring every 21 days. At the age of 18 a remission occurred which has persisted for 11 years. This patient's daughter was seen at the age of 2 years for cyclic neutropenia with a 14-day cycle and a history of repeated infections since early infancy.

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References

1. Leale, M.: Recurrent Furunculosis in Infant Showing Unusual Blood Picture, J. A. M. A. **54:**1854-1855 (June 4) 1910.

2. Reimann, H. A., and de Berardinis, C. T.: Periodic (Cyclic) Neutropenia, Entity: Collection of 16 Cases, Blood **4:**1109-1116 (Oct.) 1949.

3. (*a*) Jackson, H., Jr., and Merrill, D.: Agranulocytic Angina Associated with Menstrual Cycle, New England J. Med. **210:**175-176 (Jan. 25) 1934. (*b*) Stephens, D. J., and Lawrence, J. S.: Cyclical Agranulocytic Angina, Ann. Int. Med. **9:**31-37 (July) 1935. (*c*) Barsby, B. E., and Close, H. G.: Recurrent Neutrophil Agranulocytosis, Lancet **1:**99-101 (Jan. 24) 1942. (*d*) Borne, S.: Cyclic Neutropenia in Infant, Pediatrics **4:**70-78 (July) 1949. (*e*) Cobet, R., and Schilling, V.: Periodisch-rezidivierende Neutropenie mit Monocytose: Das Krankheitsbild der periodischen Neutropenie oder cyclischen Agranulocytose, Folia haemat. **70:**286-303, 1951. (*f*) Moncrieff, A.: Recurrent Neutropenia, Arch. Dis. Childhood **26:**438-440 (Oct.) 1951. (g) Sandella, J. F.: Cyclic Acute Agranulocytosis: Report of Case, with Improvement After Splenectomy, Ann. Int. Med. **35:**1365-1371 (Dec.) 1951. (*h*) Monto, R. W.; Shafer, H. C.; Brennan, M. J.; and Rebuck, J. W.: Periodic Neutropenia treated by Adrenocorticotrophic Hormone and Splenectomy: Report of Case, New England J. Med. **246:**893-896 (June 5) 1952. (*i*) Siguier, F., and Sebaoun, J.: Maladie périodique avec crises de sialhorrhée et neutropénie cycliques, Bull. et mém. Soc. méd. hôp. Paris **70:**27-31 (Jan. 15-22) 1954. (*j*) Good, R. A., and Varco, R. L.: Clinical and Experimental Study of Aggamaglobulinemia, Journal-Lancet **75:**245-271 (June) 1955. (*k*) Magnin, G. E.; Suits, J. J.; and Wenzel, F.: Cyclic Neutropenia: Report of Case Treated with Splenectomy, Wisconsin M. J. **56:**192-195 (April) 1957. (*m*) Page, A. R., and Good, R. A.: Studies on Cyclic Neutropenia: *Clinical and Experimental Investigation*, A. M. A. J. *Dis.* Child. **94:**623-661 (Dec.) 1957. (*n*) Chaiken, B. H.: Effect of ACTH in Periodic (Cyclic) Neutropenia, Blood **9:**83-89 (Jan.) 1954.

4. References 2 and 3*d*.

5. References 2 and 3*b* and *m*.

6. References 3*a*, *b*, and *c*.

7. References 2 and 3*c* and *m*.

8. References 2 and 3*m*.

9. References 2 and 3*e*, *g*, *h*, *k*, and *m*.

10. References 2 and 3*i*, *m*, and *n*.

11. References 1 and 2.

12. Rolland, C. F., and Davidson, L. S. P.: Case of Cyclic Neutropenia, Edinburgh M. J. **57:**205-210 (May) 1950.

13. References 2 and 3*a*, *c*, and *j*.

14. Reimann, H. A.: Periodic Disease: Observations on Old Cases and Report of New Cases and of Therapeutic Trials, A. M. A. Arch. Int. Med. **92:**494-506 (Oct.) 1953.

15. Bouroncle, B. A., and Doan, C. A.: "Periodic Fever": Occurrence in Five Generations, Am. J. Med. **23:**502-506 (Sept.) 1957.

16. References 2 and 3*f*, *g*, *h*, and *k*.

THE ASIAN '57 STRAIN OF INFLUENZA VIRUS.—Again, how new is the Asian '57 strain? Mulder (1957) reports the finding of antibody to it in persons aged 80 to 90 years, and suggests that therefore this strain may be related to that which caused the epidemic of 1889-90. Jensen and Francis (1953) have suggested that the number of antigens in influenza virus is limited, perhaps to eighteen, and that variations in virus strains over the past quarter century have merely been ringing the changes on this limited number. The practical significance of this is, of course, that by proper selection of strains one may produce a vaccine covering all the recognized antigenic components so as to give a wide cover of immunity. Without going into the question of the value of prophylactic immunization here, one may note that, on the information at present available, Mulder's findings appear to be in support of those of Jensen and Francis as to a limited number of antigens in the virus. As against this, the change from recent strains to the Asian is so marked that two injections of vaccine are required for those of us who have not as yet reached four score years, which also suggests that the dominant antigen of the Asian strain, if present, has been very well hidden for some years past.—P. N. Meenan, M.D., Epidemic Influenza, *The Irish Journal of Medical Science*, February, 1958.

USE OF PYRIDOXINE HYDROCHLORIDE TO PREVENT ISONIAZID TOXICITY

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There have been several recent reports[1] regarding the ability of pyridoxine hydrochloride and its derivatives, pyridoxal and pyridoxamine, to prevent or to delay the appearance of peripheral neuritis due to isoniazid administration. This finding was followed by the suggestion that it is now possible to use much larger doses of isoniazid (6 to 20 mg. per kilogram of body weight) than have been used routinely heretofore (3 to 5 mg. per kilogram of body weight). Subsequently, Pope[2] has shown that pyridoxal and pyridoxamine can interfere with the tuberculostatic action of isoniazid in vitro, and McCune[3] has shown an in vivo interference with isoniazid by pyridoxine. The present study was undertaken to confirm or to deny the earlier reports that the toxic effects resulting from large doses of isoniazid could be prevented by the concomitant administration of pyridoxine.

Methods and Results

Forty-eight patients were given isoniazid in the dose of 20 mg. per kilogram of body weight. In another group of 62 patients the same dose of isoniazid was given, but these patients were also given 25 mg. of pyridoxine twice daily. Other antituberculosis drugs were administered by the ward physicians as they saw fit, but vitamins were proscribed for both groups. A few patients received 450 mg., and some received 150 mg. of pyridoxine daily early in the series, but these dosages were soon reduced when it was noted that the lower dosage of 25 mg. twice daily had the same clinical effect. Some patients remained on therapy with this higher dosage of isoniazid for a period of two years. It was noted, however, that most evidence of toxicity appeared early in the course of treatment, only one patient developing signs of drug intolerance after 24 weeks. This was a patient who developed a paranoid psychotic episode after 63 weeks of therapy. She had received both isoniazid and pyridoxine and recovered promptly when the dosage of isoniazid was reduced.

The incidence of untoward drug reaction in this series may be summarized as follows: At the end of six weeks of treatment, 6 of the 48 patients (12%) on isoniazid therapy alone had some type of toxic reaction to isoniazid. Six of the 60 patients (10%) receiving isoniazid plus pyridoxine also had some type of unfavorable reaction. At the end of 20 weeks of treatment, 51% of the patients who were still in the series and who were given isoniazid alone had some manifestation of toxicity (usually peripheral neuritis), and 25% of the patients receiving both isoniazid and pyridoxine also had some type of toxicity sufficiently severe to require discontinuing or lowering the dosage of isoniazid. Additional data appear in the table.

Peripheral neuritis appeared in 14 of the patients receiving isoniazid alone but in only 1 of the patients receiving isoniazid plus pyridoxine. In this latter instance the neuritis appeared when the larger dosage of pyridoxine (450 mg.) was reduced to 50 mg. a day. Symptoms promptly cleared when the larger dosage was again instituted. The 14 examples of peripheral neuritis occurred in a group of 38 patients who completed 16 weeks of treatment, an incidence of 37%. No patient in this group developed neuritis after 16 weeks. During the period of this study (approximately two years) no patient in the approximately 300 who received isoniazid in the usual dose of 3 to 5 mg. per kilogram developed peripheral neuritis. This included the known alcoholics who, in general, were not used in the present study.

Convulsions occurred in one patient on isoniazid therapy alone and in two patients on therapy with isoniazid plus pyridoxine. This reaction was ascribed to the effect of isoniazid, since no further seizures occurred after discontinuation of the isoniazid therapy.

Psychosis occurred in one of the patients on isoniazid therapy alone but in three of those receiving isoniazid and pyridoxine. No causal relationship between this manifestation and the administration of pyridoxine is intended. It does draw attention to the fact, however, that pyridoxine prevents only one of the toxic manifestations of isoniazid, namely, peripheral neuritis.

Stupor, somnolence, and mental confusion occurred in only one patient on therapy with isoniazid alone; yet five of the patients given isoniazid plus pyridoxine exhibited this phenomenon. This is one of the reported symptoms of pyridoxine deficiency and was an unexpected finding in this group. These five patients did not show evidence of neuritis, a symptom also postulated to be due to pyridoxine deficiency. Some of these patients could not be aroused enough to eat their meals until the drugs were withdrawn.

Dizziness and ataxia were marked in two patients on isoniazid therapy alone and in three patients receiving isoniazid plus pyridoxine. Symptoms lasted only several hours after each dose of the drugs, and there were no residual signs or symptoms when the dosage of isoniazid was reduced.

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Vitamin deficiency, as judged by the appearance of seborrhea, chilitis, etc., did not appear in any of the patients in either group. The most striking finding was that while pyridoxine did prevent the appearance of neuritis in most instances, the total incidences of all toxic symptoms requiring the discontinuing of the high doses of isoniazid were strikingly similar during the first few weeks of treatment in both groups of patients. In general, the toxic manifestations in the patients receiving both isoniazid and pyridoxine were those that have long been noted during the use of isoniazid. Only the incidence of peripheral neuritis was reduced by the addition of pyridoxine to the drug regimen. While the incidence of toxicity of all types was somewhat less in the group receiving pyridoxine concomitantly, the incidence of 12% toxicity at the end of 8 weeks of treatment or of 22% toxicity at the end of 16 weeks is too great to permit recommendation of this dosage schedule to common use by physicians treating tuberculosis patients in their practices. This is especially true when one considers the serious nature of the reactions encountered.

Data on Toxic Effects in Patients on Therapy with Isoniazid Alone or with Isoniazid and Pyridoxine

Length of Therapy, Wk.	Isoniazid Therapy				Isoniazid and Pyridoxine Therapy			
	Patients		Toxic Effects		Patients		Toxic Effects	
	No.*	% with Toxic Effects†	Type	No. of Patients	No.	% with Toxic Effects	Type	No. of Patients
4 or less	48	10	Neuritis	3	62	3	Convulsions	1
			Dizziness, weakness, and somnolence	2			Dizziness and somnolence	1
6	48	12	Neuritis	1	60	10	Agitation, dizziness, and confusion	2
							Paranoia	1
							Semicoma	1
8	46	19	Neuritis	3‡	57	12	Paranoia and convulsions	1
10	43	25	Neuritis	1	52	16	Tinnitus	1
			Psychosis	1				
12	42	33	Neuritis	3	52	19	Dizziness	1
							Leg pains	1
14	38	47	Neuritis	1	49	20	...	...
			Agitation and paranoia	1				
16	38	47	Neuritis	2	49	22	Possible neuritis and abdominal pains	1
20	35	51	...	...	44	25	...	...
30	27	70	Headache	1	28	43	Neuritis	1§

* Discharge or transfer of patients resulted in decreasing number in series.
† Number of toxic reactions is cumulative.
‡ One of these also had convulsions
§ Dosage of pyridoxine was reduced.

Most patients in the series also received PAS, and many also received streptomycin. No relationship between the appearance of toxic manifestations and the administration of either of these drugs could be noted in the present study, due to lack of controls for this variable. There is ample reason to believe, however, that the administration of PAS may significantly raise the blood levels of the active form of isoniazid.[4]

The increased dosage level of isoniazid did not produce any demonstrable increase in the clinical response of the patients. Close controls were not established for this factor, yet no ward physician, house officer, or consultant was of the opinion that the increased dose of isoniazid afforded better clinical results than that seen with the more usual doses. Moreover, there was no noticeable diminution of the antituberculosis effect of isoniazid when pyridoxine in these doses was added.

The question as to whether the addition of pyridoxine to isoniazid lessens the latter's antituberculosis effects as well as reduces the incidence of peripheral neuritis is still unsettled. Yoneda and Asano,[5] in conjunction with Ata, reported that the ability of isoniazid to reduce or inhibit the decarboxylating enzyme systems in Escherichia coli was reversed when pyridoxal was added to the suspension. Similar results were reported by Boone and Woodward[6] on this and other micro-organisms. Pyridoxine did not reverse the antituberculosis action of isoniazid in vitro, although pyridoxal did do so.[7]

In vivo studies by Ungar[8] on mice showed no antagonism between pyridoxine and the antituberculosis action of isoniazid when judged by survival studies and by thymus and testes growth curves. More recently, however, McCune[3] has reported that large doses of pyridoxine and large doses of isoniazid administered to infected mice revealed that pyridoxine did antagonize the antituberculosis action of isoniazid during the last two months of a three-month experiment. This author offers the suggestion that it cannot be assumed that the total amount of isoniazid available for antimicrobial purposes in a particular patient remains the same when pyridoxine is added to the drug regimen.

Conclusions

It has again been demonstrated that the administration of pyridoxine will almost totally prevent the appearance of peripheral neuritis as a result of the administration of large doses (20 mg. per kilogram) of isoniazid. The other toxic manifestations such as psychosis, convulsions, agitation, dizziness, ataxia, and somnolence are not reduced, however. Since many patients with tuberculosis are now under the care of general physicians, it should be emphasized that serious reactions make the use of high doses of isoniazid—even with pyridoxine—unwise in the routine treatment of these patients. There appears to be little or no need for the administration of pyridoxine when the more common dose of isoniazid (3 to 5 mg. per kilogram) is used, since toxic reactions are very rarely seen with this dose. With the issue of whether or not pyridoxine interferes with the antituberculosis action of isoniazid remaining unsettled, it appears wise to use isoniazid without pyridoxine in the routine treatment of tuberculosis patients in clinical practice.

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The Pyridoxine Hydrochloride used in this study was supplied through Dr. John T. Groel, Associate Medical Director, Squibb Institute for Medical Research, New Brunswick, N. J.

References

1. Biehl, J. P., and Vilter, R. W.: Effect of Isoniazid on Vitamin B6 Metabolism: Its Possible Significance in Producing Isoniazid Neuritis, Proc. Soc. Exper. Biol. & Med. **85**:389-392 (March) 1954. Gammon, G. D.; Burge, F. W.; and King, G.: Neural Toxicity in Tuberculous Patients Treated with Isoniazid (Insonicotinic Acid Hydrazide), A. M. A. Arch. Neurol. & Psychiat. **70**:64-69 (July) 1953. Carlson, H. B.; Anthony, E. M.; Russell, W. F., Jr.; and Middlebrook, G.: Prophylaxis of Isoniazid Neuropathy with Pyridoxine, New England J. Med. **255**:119-122 (July 19) 1956.

2. Pope, H.: Neutralization of Isoniazid Activity in Mycobacterium Tuberculosis by Certain Metabolites, Am. Rev. Tuberc. **73**:735-747 (May) 1956.

3. McCune, R.; Deuschule, K.; and McDermott, W.: Delayed Appearance of Isoniazid Antagonism by Pyridoxine in Vivo, Notes, Am. Rev. Tuberc. **76**:1100-1105 (Dec.) 1957.

4. Mandel, W.; Cohn, M. L.; Russell, W. F., Jr.; and Middlebrook, G.: Effect of Para-aminosalicylic Acid on Serium Isoniazid Levels in Man, Proc. Soc. Exper. Biol. & Med. **91**:409-411 (March) 1956.

5. Yoneda, M., and Asano, N.: Competitive Action of Isonicotinic Acid Hydrazide and Pyridoxal in Amino Acid Decarboxylation of Escherichia Coli, Science **117**:277-279 (March 13) 1953.

6. Boone, I. U., and Woodward, K. T.: Relationship of Pyridoxine and Its Derivatives to Mechanism of Action of Isoniazid, Proc. Soc. Exper. Biol. & Med. **84**:292-296 (Nov.) 1953.

7. Boone, I. U.; Strang, V. G.; and Rogers, B. S.: Effect of Pyridoxal on Uptake of C^{14}-Activity from Labeled Isoniazid by Mycobacterium Tuberculosis, Am. Rev. Tuberc. **76**:568-578 (Oct.) 1957.

8. Ungar, J.; Tomich, E. G.; Parkin, K. R.; and Muggleton, P. W.: Effect of Pyridoxine on Action of Isoniazid, Lancet **267**:220-224 (July 31) 1954.

ASSAY OF ANTIANGINAL AGENTS—THE RAPPORT PERIOD

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It is essentially in the initial stages of therapy that a good psychological relationship is established between physician and patient.[1] This is termed the "rapport period." Establishment of a positive working relationship exerts a therapeutic influence in itself.[2]

In the administration of any antianginal agent, its therapeutic effect is proportional to that of the personality of the physician and his own belief in the curative powers of the medicament, plus the suggestibility of the patient and the intensity of the patient's desire to be cured.[3] The purpose of this paper is to emphasize the importance of the rapport period in the assay of antianginal agents.

Procedure

As the symptom complex of angina pectoris is a completely subjective manifestation, assay of any antianginal agent is, in essence, a measurement of the decrease in frequency and severity of attacks of chest pain. This can be clearly illustrated on a graph. Therefore, during a trial of four antianginal agents, aminotrate phosphate (Metamine), calcium theophyllinate (Calphyllin), pentaerythitol (Peritrate) tetranitrate, and chlorpromazine (Thorazine) hydrochloride, curves were constructed from the daily number of chest pains of patients with angina pectoris.[4] Each agent and its identical placebo were tested by the double-blind technique, with multiple control periods, without antianginal medication other than nitroglycerin.

Results

Of over 100 patients with angina pectoris, only 24 were suitable for the assay of the antianginal medication.[4] Examination of curves of pain frequency for these patients showed that in 14 an initial downward slope occurred, representing decreased average daily pains per week per period of study; in an additional patient, the downward slope appeared after a short initial increase in pain frequency (fig. 1). A decrease in frequency of attacks of chest pain occurred during the rapport period in each case, regardless of use of random succession of active drugs in various dosages,[4] identical placebo, or control periods without medication. The second portion of the tracing, the post-rapport period, usually was a straight line or plateau of pain frequency, always at a lower level than at the start of the rapport period. Because of its appearance, this has been called a *ski curve* (fig. 2).

The duration of the initial downward slope ranged from 2 to 24 weeks, with an average of 11 weeks. In three instances it was 10 weeks, in two instances, 8 and 14 weeks, respectively, and, in the

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remainder, 2, 3, 6, 15, 16, 19, 20, and 24 weeks (fig. 3). The range of decrease of daily pain frequency was one to eight, with an average of 3.2 daily attacks of angina per week per period of observation. Percentage-wise, the decrease of pain frequency was 66% in five cases, 40, 55, and 84% in single instances, and 50% in two cases. The improvement was 100%, of course, in five cases in which complete remission occurred.

Comment

The patients whose curves of pain frequency were analyzed knew they were placed in a select category for special attention, as over three-quarters of the patients referred to the angina study group from the general cardiac clinic of the Los Angeles County Hospital were rejected as not being suitable patients for the assay of antianginal agents.[4] They realized that they alone were being given the advantage of the latest research products for the relief of angina pectoris. Because the anginal study group met with the same personnel at weekly intervals over a two-year period, the patients came to feel that each had his own personal physician. At each visit, patients were solicitously questioned concerning the course of the disease and the effect of the medicament or placebo in the process of administration. Weight and blood pressure were noted, and heart and lungs were examined.

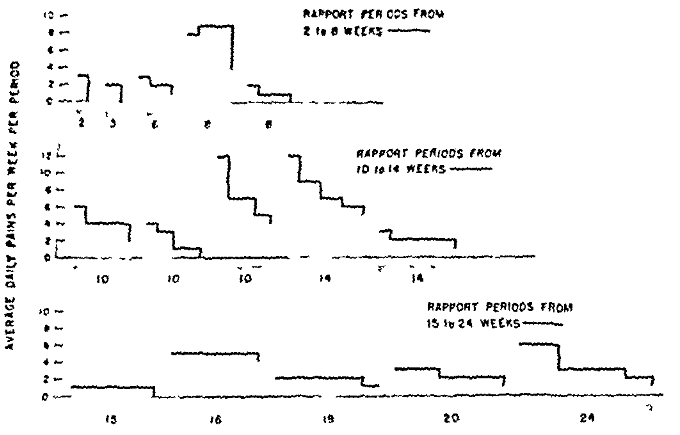

Fig. 1.—Range of rapport periods. Curves show downward slope (decreased pain frequency) in rapport periods, regardless of technique of therapy. Vertical line or downward deflection represents termination of period of study.

As each patient was instructed to keep a daily record of the frequency, duration, and severity of anginal attacks and the number of nitroglycerin tablets taken, it became evident to him that the doctors were interested not only in each patient but in each pain in each patient. The patients were questioned thoroughly concerning emotional upsets, concurrent illnesses, changes in rest or activity patterns, and other factors which might be expected to affect the course of angina pectoris. The doctors emphasized their attention and interest by recording this information in detail on a master chart which was kept for each patient.

Electrocardiograms were taken after each period of active drug or identical placebo administration; this included many more than would have been done in the course of usual cardiac clinic procedure.

From such a close patient-physician relationship and the ceremony of drug research is good rapport born. The impact of these factors on the capricious course of angina pectoris is illustrated by the descending slope of the ski curve, indicating decreased pain frequency in 15 of the 24 patients. In the nine charts which did not show the ski curve, the frequency curves were straight lines with minor fluctuations or humps of increased pain frequency coincident with concurrent illness or emotional stress and strain.

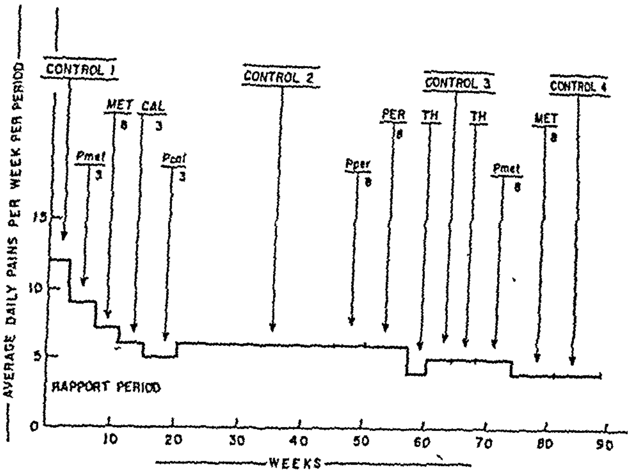

Fig. 2.—Ski curve, illustrating average number of daily attacks of chest pain in patient during administration of active drug, placebo therapy, and multiple control periods without antianginal medication. *MET* = aminotrate phosphate (Metamine), 2 mg., *CAL* = calcium theophyllinate (Calphyllin), 0.5 Gm., *PER* = pentaerythritol tetranitrate (Peritrate), 10 mg., *TH* = chlorpromazine (Thorazine), *Pmet* = aminotrate phosphate—placebo, *Pcal* = calcium theophyllinate—placebo, *Pper* = pentaerythritol tetranitrate—placebo, and (1-8) refers to number of tablets given daily (reproduced with permission from Cole and others[4]).

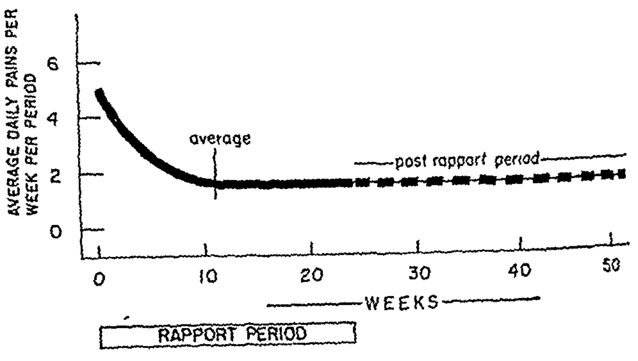

Fig. 3.—Curve of rapport effect—composite average curve constructed from rapport periods of 24 patients, with post-rapport period projected over 52 weeks.

Without the checks of the double-blind technique and multiple control periods without medication, credit for the improvement—the decrease in pain frequency—would have been given to any drug administered during the rapport period. Placebos have an average significant effectiveness of 35.2± 2.2%.[5] The continuation of improvement during the multiple control periods without active drug or placebo therapy reveal the physician-patient relationship in the rapport period to be the sole operating factor. Studies have shown pain to involve not only physical perception but also psychological reaction.[6] The level of pain perception normally is consistent from individual to individual, but persons vary greatly in their reaction to pain. Since the effectiveness of an antianginal agent is based on a cooperative patient's report of his reactions, the factors which condition these reactions must be carefully taken into consideration before a valid evaluation of the agent can be made.[5] A most important factor is a good psychological relationship, which exerts a definite therapeutic influence in the initial interval of study, the rapport period.

Summary and Conclusions

The "rapport period" is the initial interval in the course of therapy during which a good psychological relationship is established between physician and patient. Effect of the therapeutic influence during the rapport period on the assay of antianginal agents is shown by the finding that over 60% of the curves of pain frequency of patients with angina pectoris showed an initial downward slope (decreased pain frequency) over a period averaging 11 weeks, regardless of use of random succession of active drug, identical placebo, or control periods without medication.

As physician-patient rapport itself has a beneficial effect on the course of the completely subjective symptom complex of angina pectoris, an initial control period without medication is insufficient. Proper assay of antianginal agents always must include measurement against control periods after the rapport period.

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References

1. Osborne, L.: Psychiatry and Medicine, New York, McGraw-Hill Book Co., Inc., 1952, p. 116.

2. Cornell Conferences in Therapy, edited by H. Gold, New York, the MacMillan Company, 1946, pp. 58-75.

3. Greiner, T., and others: Method for Evaluation of Effects of Drugs on Cardiac Pain in Patients with Angina of Effort: Study of Khellin (Visammin), Am. J. Med. **9**:143-155 (Aug.) 1950.

4. Cole, S. L.; Kaye, H.; and Griffith, G. C.: Assay of Antianginal Agents: I. Curve Analysis with Multiple Control Periods, Circulation **15**:405-413 (March) 1957.

5. Beecher, H. K.: Appraisal of Drugs Intended to Alter Subjective Responses, Symptoms, report to the Council on Pharmacy and Chemistry, J. A. M. A. **158**:399-401 (June 4) 1955.

6. Wolff, H. G.; Hardy, J. D.; and Goodell, H.: Studies on Pain: Measurement of Effect of Morphine, Codeine, and Other Opiates on Pain Threshold and Analysis of Their Relation to Pain Experience, J. Clin. Invest. **19**:569-680 (July) 1940.

DIAGNOSTIC PROBLEMS

CONGESTIVE HEART FAILURE IN A FORTY-SIX-YEAR-OLD WOMAN

Clinical Pathological Conference (PM 534-58), May 15, 1958, from the Department of Pathology and the Hektoen Institute for Medical Research of Cook County Hospital, Chicago, presented for publication by Daniel S. Kushner, M.D., and Paul B. Szanto, M.D.

Clinical Data

First Admission.—A 46-year-old waitress entered Cook County Hospital on Aug. 6, 1956, because of chest pain of two weeks' duration. She had had rheumatic fever at the age of 8 years. At 27, she was found to have a "cardiac condition" and was placed on digitalis therapy. She discontinued the drug therapy after six years and thereafter remained symptom-free.

One year prior to admission, she noted infrequent ankle edema occurring at the end of the day and found that she slept more comfortably with two pillows. One month before admission, she noted exertional dyspnea, weakness, fatigue, anorexia, and orthopnea severe enough to require sleeping in a chair. Two weeks before admission, she had sudden severe substernal pain, radiating to both shoulders, associated with palpitation, a marked increase in dyspnea, and elevation of temperature to 101 F (38.3 C). The fever and pain largely subsided within 12 hours. For the next two weeks minimal pain persisted, but dyspnea and ankle edema became prominent. She developed a persistent cough productive on two or three occasions of clumps of dark blood. The patient's mother had died of asthma, but the family history was otherwise negative. The patient herself had had an appendectomy as a child, and she thought she was allergic to penicillin.

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Physical examination disclosed a well-nourished, well-developed white woman, who appeared anxious and in moderate respiratory distress. Her blood pressure was 116/100 mm. Hg; the radial pulse was weak. She was slightly cyanotic and had a malar flush, palmar erythema, and slight scleral icterus. There were no petechiae. Cervical veins were distended, and a hepatojugular reflux was elicited. Moist rales were heard in the lung bases bilaterally, and there was diminished resonance, fremitus, and breath sounds in the left base posteriorly. The apex of the heart was located in the fifth left intercostal space, 1 to 2 cm. to the left of the midclavicular line. The left cardiac border showed widening in the third left intercostal space.

Cardiac Catheterization Data

Laboratory Findings	Values
Blood oxygen content, vol. %	
Inferior vena cava	12.81
Superior vena cava	11.07
Right atrium, upper	11.62
Right atrium, lower	13.72(65.4%)
Right ventricular outflow	12.25
Pulmonary artery, main	12.03
Pulmonary artery, right	12.42
Left superior vena cava	16.46(78.4%)
Coronary vein, upper	16.48(78.6%)
Femoral artery content	17.89
Oxygen capacity	20.98
Oxygen saturation, %	85.30
Hemoglobin, Gm. per 100 cc	15.42
Intravascular pressures,* mm. Hg, systolic/diastolic (mean)	
Right atrium	... (13)
Right ventricle	81/0-10(44)
Pulmonary artery	81/32(50)
Coronary vein	... (13)
Calculated blood flows	
Systemic†	
Liters/min.	3.13
Liters/min./sq m.	2.09
Pulmonary†	
Liters/min.	2.77
Liters/min./sq.m.	1.81
Systemic stroke, cc.	32.6
Pulmonary stroke, cc.	29.9
Shunt, cc./min.	
Right-to-left	718
Left-to-right	363
Over-all, right-to-left	355
Pulmonary arteriolar resistance‡, dynes/sec./cm.$^{-5}$	1,441
Index	2,206

* Normal values for the first three items are, respectively, 2-10 (mean), 25/5, and 25/10.

† Normal value is 3-3.5.

‡ Normal value is 100-300.

Percussion of the xyphoid disclosed flatness. There was epigastric pulsation. The rhythm, which was regular, was demonstrated by electrocardiography to be a 2:1 atrial flutter. The first heart sound at the apex was markedly accentuated. No thrills were palpable. The second heart sound was louder at the pulmonic area than at the aortic area. Murmurs were heard over the entire precordium but were loudest at the left fourth intercostal space parasternally, consisting of a grade 2 harsh systolic murmur and a grade 3 blowing decrescendo diastolic murmur heard throughout most of diastole. The liver edge was blunt, smooth, nontender, and was located two fingerbreadths below the right costal margin. The area of splenic dulness was increased, and one observer felt the tip of the spleen at the costal margin. Except for a few left axillary nodes, there was no lymphadenopathy. There was 2+ edema of the legs and 3+ edema of the buttocks. There was no evidence of thrombophlebitis in the legs and no clubbing of the fingers. The peripheral pulses were normal.

Urinalysis was negative. The hemoglobin level was 105%; the leukocyte count was 15,800 per cubic millimeter, with 80% neutrophils, 5% band forms, 8% lymphocytes, and 7% monocytes; 1+ polychromatophilia and 1+ toxicity were observed; and the platelets appeared normal. Repeated roentgenograms of the chest showed the heart to be moderately enlarged in its transverse diameter. Both pulmonary arteries were greatly enlarged, almost reaching aneurysmal proportions. The aortic knob was small. Lung markings were increased. At times there were densities in the posterior basal segment of the left lower lobe and a small pleural reaction at the left costophrenic angle. Fluoroscopy confirmed these findings.

The point of opposite pulsation was depressed. In the posteroanterior view, the esophagus was displaced to the right. In the right anterior oblique view, it appeared displaced posteriorly and compressed. The pulmonary artery segment encroached on the retrosternal space. In the left anterior oblique view, the left ventricle cleared the spine. Electrocardiograms disclosed atrial flutter with varying ventricular response and marked right ventricular hypertrophy. The blood Kahn reaction was positive and the result of the blood Wassermann test doubtful. The serum nonprotein nitrogen level was 53 mg. per 100 ml., serum sodium level 130 mEq. per liter, serum chloride level 89 mEq. per liter, and serum potassium level 3.3 mEq. per liter. Blood cultures showed no growth. The results of cardiac catheterization are shown in the table. (This catheterization was performed using a median antecubital vein of the left arm. The cardiac rate was 96 per minute; the surface area was 1.53 sq. m. During manipulation of the catheter in the right atrium, it was believed that the left atrium was repeatedly entered. Oxygen consumption measured 213 cc. per minute on the day after catheterization under similar conditions of sedation. R. Q. = 0.85; BMR = +13%.)

After admission, the patient was digitalized and placed on therapy with a low-sodium diet, mercurial diuretics, ammonium chloride, and bed rest. On this regimen her ventricular rate dropped to the 80's. The mechanism remained atrial flutter with variable atrioventricular block. She had satisfactory diuresis, and peripheral edema gradually disappeared. Throughout her hospital stay, the findi in the base of the left lung (dulness, diminished breath sounds, and rales) appeared and disappeared. She was given penicillin and tetracycline at different times because of these findings. Once, a small scleral hemorrhage was noted in the right eye, but no other hemorrhagic manifestations were observed. On three occasions, she developed transient chest pain which disappeared over night. As a result, she was given anticoagulants until her discharge on Sept. 4, 1956, to attend the outpatient clinic.

Second Admission.—For the next year the patient did well, with the sole complaint of recurrent shooting pains in the right arm. On the morning of Aug. 19, 1957, she was awakened with severe pain in that arm; it rapidly became cold, blue, and numb, and the hand became paralyzed. Physical findings were as previously described, except for absence of pulsations below the right axilla and decreased temperature, cyanosis, and anesthesia of the right arm. At an emergency operation an embolus 1.5 cm. long was removed from the right brachial artery. Except for easily controlled, mild, congestive heart failure, the patient's course was uneventful, and she was discharged much improved one month later on anticoagulant therapy.

Third Admission.—The patient remained well until April 1, 1958, when she suddenly experienced a crushing pain in the left precordium and fainted. She was brought to the hospital immediately, where examination disclosed an acutely ill, cyanotic, perspiring patient. Her blood pressure was 110/80 mm. Hg, pulse 70 per minute and irregular, respirations 32, and temperature normal. The heart tones were distant, and no distinct murmurs were heard. Her cervical veins were distended, and her liver was tender and palpable at the level of the umbilicus. There was no peripheral edema. An electrocardiogram indicated acute posterior myocardial infarction, in addition to the previous findings.

She appeared improved after treatment with morphine, oxygen, digitoxin, and heparin. On the following day the cardiac findings were as previously noted, the murmurs being distinct. In addition, a definite mid-diastolic rumble was heard, well localized to the fifth intercostal space, near the anterior axillary line. On the afternoon of the second day, however, she had a recurrent chest pain and quietly died.

Clinical Discussion

Dr. George C. Griffith: Our problem is the differential diagnosis of the cardiac disease which caused this woman's death at the age of 48 years. She was alleged to have had rheumatic fever in childhood, but we are given no historical data in support of this. One might speculate that the reason for placing her on digitalis therapy at the age of 27 was an arrhythmia, probably paroxysmal tachycardia, because she had no symptoms of congestive failure, and she did so well at that time. Her first symptoms of heart failure occurred at the age of 45. At age 46 she had full-blown symptoms of myocardial insufficiency. One attributes the orthopnea and dyspnea to left heart failure, but the weakness and fatigue represent pulmonary hypertension and hypoxia. The character of the substernal pain in association with fever, cough, and hemoptysis is more suggestive of pulmonary embolization than of coronary artery disease, especially in a premenopausal woman. The cyanosis observed suggests a generalized peripheral rather than central type, but the absence of clubbing of the fingers does not of itself exclude a reversed intracardiac shunt. The slight icterus would favor pulmonary infarction.

She did have a positive hepatojugular reflux, so she should have had right-sided failure with tricuspid insufficiency. She also had rales and signs of infiltration at the base of the left lung, which was probably the location of her embolus. The heart was enlarged, and, in the absence of an apical thrust, we have no index as to the size of the left ventricle, but the epigastric pulsation suggests right ventricular hypertrophy. The widened base may mean a large left pulmonary artery or left atrium. The regular rhythm subsequently identified as atrial flutter should have been diagnosed by the pulsation of the veins of the neck being twice that of the ventricular rate. The first sound was accentuated but was not accompanied by a thrill, and nothing was said about an opening snap, so one cannot diagnose mitral stenosis. From the description of the murmurs, I would think that she probably had pulmonary valvular insufficiency. The electrocardiograms showed atrial flutter, right axis deviation, and partial right bundle-branch block.

Dr. William Meszaros: The first roentgenogram (September, 1956) showed an increased transverse cardiac diameter. Both pulmonary arteries were markedly enlarged. The aortic knob was small. The vascular branches beyond the hilum were not prominent. The apical contour did not suggest a large left ventricle. The clear space between the right pulmonary artery and the hilum would not suggest mitral stenosis, in which this space is obliterated. There was pleural thickening at the left base. In the right anterior oblique projection, there was enlargement of the left atrial contour and prominence of the pulmonary artery segment. In the left anterior oblique projection, there was a prominent right atrium. The right ventricular contour did not appear prominent, but the left ventricle overlaid the spine. In correlation with the other views, this was probably a normal left ventricle displaced by a large right ventricle.

The film taken on the second admission (October, 1957) showed no significant change. The diminished peripheral pulmonary vascular markings suggested pulmonary arteriosclerosis. Radiologically, this patient had cardiac enlargement with right atrial and ventricular enlargement and minimal left atrial enlargement. Etiologically, rheumatic heart disease can be discounted, because the left atrium was not prominent. The radiologic findings suggest atrial septal defect with pulmonary arteriosclerosis. The slight enlargement of the left atrium might be the result of a right-to-left shunt or some associated mitral stenosis.

Dr. Joshua Lynfield: The late Dr. Robert Dillon performed the cardiac catheterization. From the series of blood samples, we hoped to deduce evidence of left-to-right shunt, as shown by increased oxygen content at the level of any defect. The superior vena cava oxygen content was normal, while the inferior vena cava had a high oxygen content, with a slight increment at the level of the lower right atrium. This might suggest a communication at that level. This appeared to be borne out by the evidence that the left atrium was repeatedly entered. Unfortunately, no sample of that blood was obtained. The left superior vena cava and the coronary vein had an oxygen content of 16.46 and 16.48 vol. %, respectively, which was close to the femoral artery oxygen content and suggested anomalous pulmonary venous drainage into that area. That is often associated with atrial septal defect. The right atrial pressure was elevated to 13 mm. Hg.

One would anticipate that in the presence of a large atrial septal defect the pressures in both atria would be equivalent. The pulmonary artery pressure of 81/32 mm. Hg reflected a marked pulmonary and right ventricular hypertension. The diastolic blowing murmur transmitted down the left sternal border is probably explained by pulmonary insufficiency. The coronary vein pressure of 13 mm. Hg was identical to that in the right atrium. The pulmonary vascular resistance was calculated to 1,414 dynes/second/centimeter $^{-5}$, and the index was 2 236 dynes, which is markedly increased. If the resistance to filling of the right ventricle is greater than to that of the left ventricle then right-to-left shunt develops, and there must have been some right-to-left shunt because of the diminished peripheral arterial oxygen content. The catheterization data are consistent with the presence of an atrial septal defect with severe pulmonary hypertension and associated shunting of an anomalous pulmonary venous drainage.

Lutembacher's syndrome, or atrial septal defect with associated mitral stenosis, has also to be considered. To substantiate this diagnosis a diastolic pressure gradient across the mitral valve should be present in addition to the usual findings of atrial septal defect. However, the left ventricle was not entered, and a separate left heart catheterization was not performed so that the catheterization data are not complete enough to prove this possibility.

Dr. Griffith: I concur entirely with that diagnosis. The second admission was evidently occasioned by a right brachial embolus, which apparently had originated from the left heart. Her final episode seemed to be the result of either myocardial or pulmonary infarction. Did she have radiologic evidence of another pulmonary embolus?

Dr. Meszaros: The lung fields were unchanged throughout. No pulmonary infiltrations interpretable as infarcts were seen.

Dr. Griffith: In the final analysis, this was a 46-year-old woman with no real cardiac difficulty until she was 45, when she developed left and right heart failure, atrial flutter, cardiac enlargement, symptoms and signs of pulmonary hypertension with insufficiency, relative tricuspid insufficiency, and right ventricular hypertrophy. All of her episodes of chest pain were probably due to pulmonary embolism, from both the character of the pain and the later electrocardiographic evidence of posterior myocardial infarction. She had one embolus to the right brachial artery. She might have had others to her coronary vessels, producing a myocardial infarct, but I would not assume this. The cardiac catheterization demonstrated the dynamics of an atrial septal defect and abnormal drainage of the pulmonary veins. It is difficult to decide whether the atrial septal defect was of the secundum or ostium primum type. The cyanosis would raise the question of relative mitral insufficiency with drainage from both atria, but there was neither a mitral systolic murmur nor left ventricular hypertrophy.

I would make a diagnosis of congenital heart disease, atrial septal defect of the ostium secundum type, with associated anomalous pulmonary venous drainage into the coronary sinus. I believe she also had multiple pulmonary emboli, which is the common factor in atrial septal defect which precipitates cardiac failure, particularly acute failure. Certainly, she had time to acquire a pulmonary hypertension. She probably had a relatively normal pulmonary pressure in infancy but, because of continuing increased flow, she developed pulmonary artery spasm with pulmonary arterial thickening and some pulmonary arteriosclerosis or arteriolar sclerosis, which produced the fixed hypertension. I do not believe she had mitral valve disease. The diastolic murmur may find its explanation in a relative tricuspid stenosis.

Such findings are frequently interpreted as Lutembacher's syndrome or mitral stenosis, associated with atrial septal defect, but among cases of atrial septal defect we have had to date only one with associated mitral stenosis.[1] I therefore do not anticipate that this will be a Lutembacher's syndrome. The fatal episode of congestive heart failure was probably precipitated by multiple pulmonary emboli.

Clinical Diagnosis.—The clinical diagnosis was atrial septal defect, anomalous pulmonary venous drainage, pulmonary hypertension and arteriosclerosis, and multiple pulmonary emboli with infarction.

Pathologist's Report

Dr. Paul B. Szanto: The body was that of a well-developed, well-nourished, white woman with pitting edema of the lower extremities. The fact that in this instance the body was well developed needs to be emphasized because of the clinical diagnosis of interatrial septal defect. It is frequently stated that this malformation of the heart is, especially in infants and children, associated with a general underdevelopment due to deficient body growth.

The kidneys were smaller than normal (combined weight 250 Gm.) and showed fine granularity of the surface, characteristic of arteriolar nephrosclerosis. This gross pathological diagnosis was confirmed microscopically by the demonstration of sclerosis of arterioles and small arteries and partial or complete hyalinization of some of the glomeruli. With regard to the question concerning the possible presence of mitral stenosis, it is of interest that in our material, the association of mitral stenosis in the fourth and fifth decades of life with arteriolar nephrosclerosis is much more frequent than the incidence of arteriolar nephrosclerosis in the respective age groups.

The liver was about normal size (1,300 Gm.), its edge was partly blunt and partly sharp, and its surface was somewhat irregular with moderate diffuse thickening of its capsule. It was firm with increased resistance to cutting. On cut section the lobular architecture was obscured, of variegated appearance, with occasional regenerative yellow nodules and fine strands of connective tissue trabeculae. Microscopically the lobular architecture of the liver was obscured but still preserved with fibrous thickening of the walls of the central veins and fibrous enlargement of the portal fields.

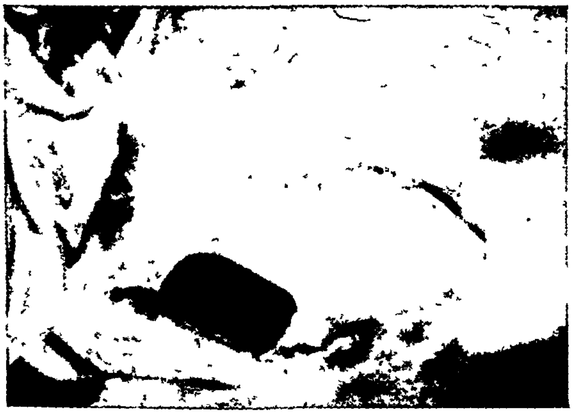


Fig. 1.—Atrial septal defect as viewed from right atrium.

In some areas connective tissue strands connected the fibrous walls of the neighboring central veins and the central veins with the portal fields. There was also some evidence of nodular regeneration, and moderate fatty changes were also present. The term cardiac fibrosis or cardiac sclerosis is preferred for this type of hepatic lesion instead of the widely used term of cardiac cirrhosis. Severe cardiac fibrosis of the liver occurs chiefly secondary to constrictive pericarditis and secondary to relative or absolute incompetence of the tricuspid valve. The spleen (150 Gm.) showed the typical appearance of a chronic passive congestion.

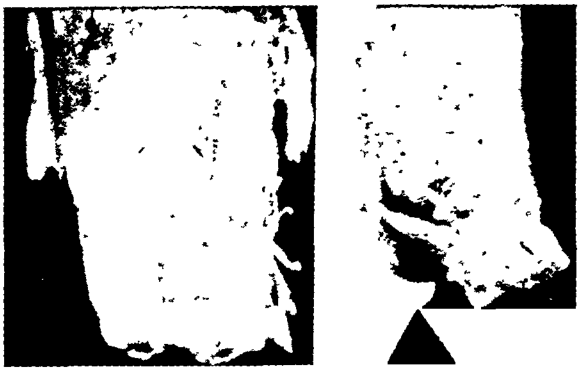


Fig. 2.—Wall of right ventricle (*arrow*), almost as thick as that of the left ventricle.

The pericardial cavity contained 60 cc. of fluid, a minimal hydropericardium, without any evidence of constrictive pericarditis. The heart was enlarged (500 Gm.). The apex was formed chiefly by the right ventricle. The right atrium was markedly dilated and, in the region of the fossa ovalis, there was a large septal defect measuring 2.5 by 2 cm. (fig. 1). The tricuspid orifice was enlarged to 14.5 cm. in circumference. The tricuspid leaflets were normal. Thus, a relative incompetence of the tricuspid valve explains the development of a cardiac fibrosis of the liver.

The orifice of the coronary sinus was dilated due to drainage of the persistent left superior vena cava into the coronary sinus, confirming again the clinical diagnosis. The right ventricle was dilated and hypertrophied. Its wall was measured (without the trabeculae) between 5 and 7 mm., being twice its normal thickness, while the wall of the left ventricle was normal in thickness (fig. 2). The pulmonary orifice was widened. Its circumference measured 9 cm., and the pulmonary artery and its main branches were greatly dilated (aneurysm-like dilatation). The left atrium was also dilated but not as much as the right. The endocardium of the left atrium was moderately thickened. A few small thrombi were attached to the endocardium of the left auricle. The left ventricle was normal in size, but the circumference of the mitral orifice was smaller than normal, measuring only 6.5 cm. The chordae tendineae of the mitral leaflets were thickened, shortened, and fused. The leaflets were thickened along the line of closure and showed fusion at the commissures (fig. 3).

Are we dealing with an acquired or congenital mitral stenosis? Histologically, the perivascular lymphocytic infiltration of the central parts and the vascularization of the base of the leaflets were interpreted as evidence of an acquired mitral stenosis. The aortic valve, with a circumference measuring 7 cm., was normal. Thus far, the association of a large atrial septal defect with an acquired mitral stenosis permits the diagnosis of Lutembacher's syndrome.

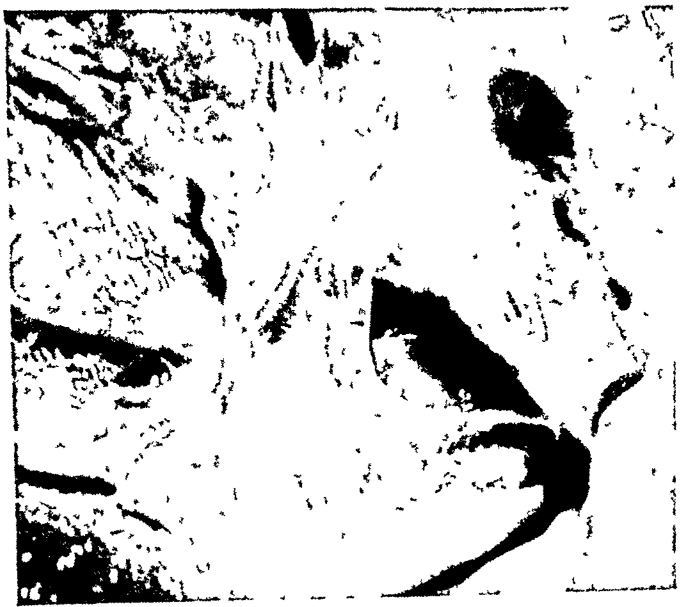


Fig. 3.—Chordae tendineae of the mitral leaflets thickened, shortened, and fused, moderate degree of fusion between thickened anterior and posterior leaflets.

The pulmonary artery and its branches were markedly dilated, and the intima was thickened, presenting a severe pulmonary sclerosis, as a result of the tremendous pulmonary overflow secondary to the left-to-right shunt through the atrial septal defect. A systematic examination of the pulmonary vessels demonstrated the following morphologic changes: 1. The capillary basement membranes in the alveolar septums showed focal rather than diffuse thickening. These changes are ascribed to the mitral stenosis. Many of the capillaries were dilated and engorged with red blood corpuscles. 2. The small arteries showed moderate tunica media and occasionally intimal thickening with narrowing of their lumens. Similarly, the muscular tunica media of the medium-sized and the elastic tissue media of the large branches of the pulmonary artery were moderately thickened. These vascular changes reflected the development of marked pulmonary vascular resistance secondary to increased pulmonary blood flow.

Microscopically, the myocardium of the left ventricle showed scarring evidenced by broad bands of connective tissue enlarging the preexistent connective tissue septums, occasionally also replacing relatively few myocardial fibers. In the right ventricle the myocardial scarring was limited to the papillary muscles and subendocardium, and it was more extensive than in the left ventricle. The subendocardial scarring is interpreted as the end-product of subendocardial microinfarcts resulting from absolute or relative insufficiency of the coronary blood supply.

In addition to these older lesions, the posterior wall of the right ventricle just above the apical region revealed a recent lesion measuring 3 by 3 cm. In this area the myocardium felt soft and flabby. The lesion occupied chiefly the central mass of the myocardium. It consisted of yellow-gray t bright yellow foci adjacent to or surrounded b hemorrhagic areas (fig. 4). Microscopically, th lesion was characterized by increased acidophili fragmentation, and loss of cross striation of th muscle fibers. The nuclei of the myocardial fibe were pyknotic or absent. Edema, hemorrhage, b ginning fatty degeneration of the myocardial fibe and leukocytic infiltration completed the typic picture of an acute myocardial infarct of three four days' duration. The interesting feature of th infarct was, however, its rare location, namely the right ventricular wall.

The coronary arteries were patent; they failed to reveal thrombotic or embolic occlusion or even severe atherosclerosis. Microscopically, however, a section taken from the infarcted area revealed recent occlusion of the small branches of the coronary arteries, whereby the walls of the vessels at the site of occlusion were not diseased.

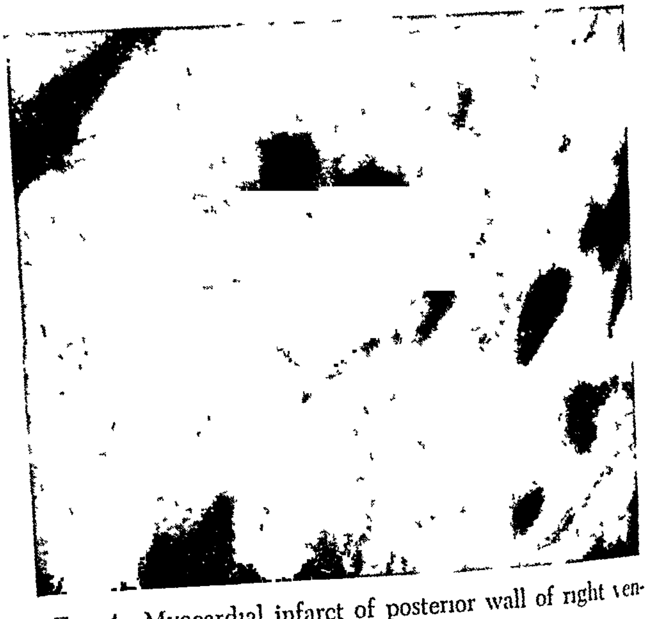


Fig. 4.—Myocardial infarct of posterior wall of right ventricle.

Pathological Diagnosis.—Pathological diagnosis was large atrial septal defect; persistent left superior vena cava opening into coronary sinus; mitral stenosis (acquired); hypertrophy and dilatation of the right ventricle and right atrium; moderate dilatation of the left atrium; thrombosis of the left auricular appendage; marked dilatation of the pulmonary artery; recent myocardial infarct of the posterior wall of the right ventricle due to coronary embolism; moderate myocardial fibrosis of the left ventricle; subendocardial myocardial scarring of the ight ventricle; pulmonary arteriosclerosis; cardiac ibrosis (cirrhosis) of the liver; and arteriolo-ephrosclerosis.

Comment

Dr. Szanto: This is a classic instance of Lutembacher's syndrome, which is a combination of atrial septal defect with congenital, or more frequently, as in this case, with acquired mitral stenosis. Atrial septal defect is a common form of congenital heart disease. It occurs twice as frequently (Lutembacher's syndrome three or four times as frequently) in females as in males. There are three types of embryonal septal defects, depending on their embryonal origin and location. 1. Complete or almost complete absence of atrial septum (cor triculare biventriculare) is the result of early arrest of the septal development. 2. Perisistent ostium primum is due to failure of the union between septum primum and the fused two atrioventricular endocardial cushions resulting in division of the common atrioventricular canal into mitral and tricuspid orifices. 3. "True patency of the foramen ovale" (Edwards[2]) should not be confused with the frequently present, clinically insignificant, slit-like orifice of the foramen ovale kept closed by its valve ("probe patent foramen ovale" occurring in 25% of all adults). The widely open foramen ovale is the commonest type of atrial septal defect. It is not covered by the valve and is caused by either regression of the septum primum or a defective septum secundum. This case is a typical example of this type of atrial septal defect.

In uncomplicated septal defect, regardless of the anatomic type, the shunt is directed from the left into the right atrium. There is also a simultaneous right-to-left shunt, which, however, is much less in volume than the left-to-right shunt and is not sufficient to cause cyanosis. The predominant left-to-right shunt will increase the blood flow through the right atrium and right ventricle, resulting in an increase of the right ventricular output. It therefore increases the pulmonary blood flow. The right atrium and right ventricle become dilated and hypertrophied. While the pulmonary artery and its extrapulmonary branches become dilated, a dilatation which may assume aneurysm-like proportion, the aorta is relatively narrow. The disproportion between the size of the pulmonary artery and that of the aorta reflects well the difference in the blood volume between the two ventricles. Despite the increased pulmonary blood flow, the pulmonary pressure may be normal as long as the pulmonary vascular resistance is low.

In such instances the intrapulmonary arteries of all sizes appear microscopically normal[3]; their walls are thin and their lumens are wide. Only the tortuosity of the arteries may indicate the increased pulmonary flow. Massive pulmonary hemorrhage may occur as a complication of excess pulmonary blood flow. Earlier or later, however, the increased pulmonary blood flow will lead to elevation of the pulmonary vascular resistance and consequently raising of the pulmonary arterial pressure.

The morphologic changes of the intrapulmonary arteries, as Edwards pointed out, reflect to some extent the height of the pulmonary pressure. If the pulmonary pressure is elevated to 40 to 80 mm. Hg, the walls of the small arteries and arterioles are thickened and the medium-sized muscular pulmonary arteries show hypertrophy of their tunica media. If the pulmonary hypertension is 80 mm. or higher, reaching even the level of systemic blood pressure, the thickening of the walls of the intrapulmonary arteries of all calibers is more marked and the media thickening is accompanied by intimal fibrosis with resulting partial or complete occlusion of the arterial lumens. In this case the intrapulmonary systolic arterial pressure was just above 80 mm. and the morphologic alterations of the pulmonary arteries were accordingly distinct. The intimal thickening of the small arteries is more characteristic for Lutembacher's syndrome than for pure atrial septal defect.

Uncomplicated atrial septum defects belong to the group of acyanotic congenital heart diseases. This condition may remain unrecognized clinically until adult life, when it may manifest itself by congestive heart failure or by other complications, such as paradoxic embolism or cerebral abscess. As a result of congestive heart failure and/or marked elevation of the pulmonary arterial pressure, the pressure in the right atrium becomes higher than that in the left atrium, left to right shunt will prevail, and cyanosis will appear. In this case the combination of congestive heart failure with markedly increased pulmonary resistance explains the cyanosis.

Dr. Griffith has rightly pointed out that Lutembacher's syndrome is rare, and it is overdiagnosed clinically and pathologically, while the uncomplicated atrial septum defect is a frequent cardiac malformation. The pathological physiology of the Lutembacher's syndrome is practically identical with that of atrial septum defect, but because of the mitral stenosis the left intra-atrial pressure is higher, and therefore the left-to-right shunt is expected to be greater than in isolated atrial septal defect.

Two days prior to her death the patient in this case experienced a "crushing" pain in the left chest. The electrocardiogram indicated an acute posterior wall infarct. This diagnosis was confirmed at autopsy, but the infarct was located in the posterior wall of the right ventricle and not in the posterior wall of the left ventricle as expected. Myocardial infarct of the right ventricle is rare. Its incidence is estimated between 1.5[4] and 3%.[5] Various explanations for the rarity of right ventricular infarct are offered, two of which will be mentioned here. 1. The smaller myocardial mass is supplied by richer coronary anastomosis[6] than is the larger myocardial mass of the left ventricle. 2. The right ventricle is composed mainly of the deep sinospiral muscle bundles at the base and superficial and deep sinospiral muscle bundles at the apex.[7] According to Dr. Wartman, for some unknown reason, the deep sinospiral muscle is affected less frequently than the other muscle bundles, and this accounts for the rarity of the myocardial infarct of the right ventricle.

The coronary arteries grossly failed to reveal any occlusion of their lumens or even arteriosclerotic changes, in spite of the careful examination of all the microscopically demonstrable arterial branches by transverse sections. It is generally recognized that inadequate coronary blood supply due to atherosclerotic narrowing of the coronary arteries may cause myocardial infarction without occlusion. The incidence of this occurrence varies between 30 and 60% in the various series.[8] The incidence of antecedent hypertension and old infarcts leading to hypertrophy is greater in patients with myocardial infarction due to marked coronary sclerosis without occlusion than in those with myocardial infarct due to coronary occlusion.

In this case atherosclerosis of the coronary arteries was absent, and only the microscopic examination revealed recent occlusion of the small arteries. Because of the absence of any evidence of pathological changes in the arterial wall at the site of occlusion, the diagnosis of coronary embolism was made. The left auricular thrombi presented a possible source of coronary embolism, although the possibility of paradoxical embolism from the right auricular appendage or from an unidentified focus of the venous circulation has also to be considered.

Anyhow, our case fulfills the criteria set by Saphir[9] and others[10] for the pathological diagnosis of coronary embolism. The interesting feature of this case, however, is the site of the myocardial infarction in the right ventricle combined with absence of involvement of the larger coronary arteries. It is possible that a study of the coronary arteries by means of injecting radiopaque material as described by Blumgart and others[11] might have enabled us to demonstrate embolic occlusion of larger arterial branches than those demonstrated in the sections; but even then the fact remains that the occlusion of small or relatively small arterial branches led to such a large myocardial infarct. We have repeatedly observed large and medium-sized coronary arteries with only insignificant arteriosclerotic changes and partial or complete, arteriosclerotic or thrombotic occlusion in only the small arteries of the infarcted areas.

This case illustrates that myocardial infarction is not necessarily bound to thrombotic or embolic occlusion of the large branches of the coronary artery. Any disproportion between demand and supply of blood may result in an impairment of the heart muscle. The marked hypertrophy of the right ventricle led to a relative coronary insufficiency. The large mass of the myocardium of the right ventricle outgrew its blood supply. This relative coronary insufficiency predisposed the right ventricle to a massive infarction secondary to embolic occlusion of the small arterial branches. The sudden onset of the clinical symptoms is one of the characteristic features of coronary embolism.

The intensive cardiac studies were performed by Dr. Robert F. Dillon of the Cardiophysiology Department of Cook County Children's Hospital, under the direction of Dr. Benjamin M. Gasul.

References

1. Cosby, R. S., and Griffith, G. C.: Interatrial Septal Defect, Am. Heart J. **38**:80-89 (July) 1949. Griffith, G. C.: Personal communication to the authors.

2. Edwards, J. E.: Congenital Malformations of the Heart and Great Vessels, in Pathology of Heart, edited by S. E. Gould, Springfield, Ill., Charles C Thomas, Publisher, 1953, p. 267.

3. Edwards, J. E.: Structural Changes of Pulmonary Vascular Bed and Their Functional Significance in Congenital Cardiac Disease: 26th Ludvig Hektoen Lecture, Proc. Inst. Med. Chicago **18**:134-146 (June 15) 1950.

4. Wartman, W. B., and Hellerstein, H. K.: Incidence of Heart Disease in 2,000 Consecutive Autopsies, Ann. Int. Med. **28**:41-65 (Jan.) 1948.

5. Saphir, O.; Priest, W. W.; and Katz, L. N.: Coronary Arteriosclerosis, Coronary Thrombosis, and Resulting Myocardial Changes, Am. Heart J. **10**:567 (June); **10**:762 (Aug.) 1935.

6. Prinzmetal, M., and others: Studies on Coronary Circulation: III. Collateral Circulation of Beating Human and Dog Hearts with Coronary Occlusion, Am. Heart J. **35**:689-717 (May) 1948.

7. Wartman, W. B., and Souders, J. C.: Localization of Myocardial Infarcts with Respect to Muscle Bundles of Heart, Arch. Path. **50**:329-346 (Sept.) 1950.

8. Miller, R. D.; Burchell, H. B.; and Edwards, J. E.: Myocardial Infarction With and Without Acute Coronary Occlusion: Pathologic Study, A. M. A. Arch. Int. Med. **88**:597-604 (Nov.) 1951. Friedberg, C. K., and Horn, H.: Acute Myocardial Infarction Not due to Coronary Artery Occlusion, J. A. M. A. **112**:1675-1679 (April 29) 1939. Lisa, J. R., and Ring, A.: Myocardial Infarction or Gross Fibrosis: Analysis of 100 Necropsies, Arch. Int. Med. **50**:131-141 (July) 1932.

9. Saphir, O.: Coronary Embolism, Am. Heart J. **8**:312-322 (Feb.) 1933.

10. Shrader, E. L.; Bawell, M. B.; and Moragues, V.: Coronary Embolism, Circulation **14**:1159-1163 (Dec.) 1956.

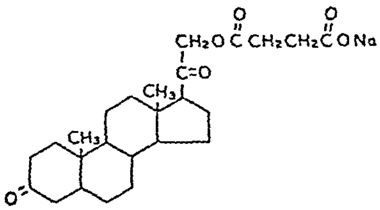
11. Blumgart, H. L.; Schlesinger, M. J.; and Zoll, P. M.: Angina Pectoris, Coronary Failure and Acute Myocardial Infarction: Role of Coronary Occlusion and Collateral Circulation, J. A. M. A. **116**:91-97 (Jan.) 1941.

COUNCIL ON DRUGS

NEW AND NONOFFICIAL DRUGS

Monographs and supplemental statements on drugs described here and in subsequent editions of New and Nonofficial Drugs are based on the evaluation of available scientific data and reports of investigations. H. D. Kautz, M.D., *Secretary.*

Hydroxydione Sodium Succinate.—Sodium 21-hydroxypregnane-3,20-dione succinate.—The structural formula of hydroxydione sodium succinate may be represented as follows:



Actions and Uses.—Hydroxydione sodium succinate is a steroid compound, but its actions in no way resemble those of the adrenal or sex steroid hormones. Hydroxydione produces a nonselective central nervous system depression leading to hypnosis and general anesthesia. The drug induces changes in the electroencephalogram similar to those seen with thiopental, but its onset of action is much slower than with thiopental. Little is known about its mechanism of action, metabolic fate, or excretion.

Hydroxydione sodium succinate is used intravenously as a basal anesthetic or for the induction of general anesthesia prior to maintenance with nitrous oxide–oxygen or other gaseous anesthetic agents. It is not sufficiently potent for use as the sole anesthetic, even for minor procedures involving little trauma. Induction with hydroxydione is characterized as smooth but slow, at least in comparison with the ultra-short-acting thiobarbiturates. For most patients, consciousness is not lost until three to five minutes after the last of the drug has been infused. Since relatively large amounts of the diluted drug solution must be used, induction generally requires up to 20 minutes. This delay in outward signs of drug action makes it difficult to judge accurately the dose needed. Recovery from anesthesia is usually complete within two to three hours. Because of its slow onset and prolonged duration of action, hydroxydione is not as satisfactory as thiopental and related thiobarbiturates for emergency use or for short operative procedures. The drug exerts an amnesic effect; little postoperative depression or nausea and vomiting are observed after recovery from anesthesia.

Hydroxydione sodium succinate provides little, if any, analgesia and does not affect glandular secretions. Hence, it should be used in conjunction with antisecretory, sedative, and/or analgesic premedication. The drug appears to depress laryngeal and pharyngeal reflexes so that laryngospasm is rarely a problem. It does not suppress the cough reflex. For this reason, patients may buck or cough if an endotracheal tube is passed without prior application of a topical anesthetic. Since muscle relaxation with hydroxydione is only moderate, the drug cannot be depended upon to provide relaxation by itself. The usual anesthetic doses of hydroxydione produce little respiratory depression, although apnea can occasionally occur; tachypnea, with rates of 30 to 40 per minute, is observed in some patients. Hypotension, especially reduction in pulse pressure, attending the use of hydroxydione may also be observed, particularly when the rate of intravenous flow is too fast or when excessively concentrated solutions are used. This is usually slow in onset, with maximum depression in blood pressure generally occurring 10 to 20 minutes after induction is completed. The hypotension occasionally may be sufficiently severe to require the administration of vasopressor agents. The drug has, apparently, no tendency to produce cardiac irregularities.

Hydroxydione sodium succinate has a decided venous irritating effect, which constitutes a drawback to its clinical use. Pain at the site of injection is frequently observed, occasionally followed by chemical thrombophlebitis. The irritating effect is more pronounced with concentrated solutions. As with any intravenously administered solution, repeated injections into the same vein apparently enhance the likelihood of venous irritation. Extreme care should be taken to insure against accidental extravasation of the drug into the tissues. The veins of the lower extremities and the small veins of the hand and wrist should not be used for intravenous injection.

Since the classical signs of anesthesia are obscured by administration of hydroxydione, it is necessary to rely on the reflex activity of the patient to determine the depth of anesthesia. The drug is contraindicated in patients with hypotension or tachycardia. It should be administered only by anesthesiologists well trained in the physiology and pharmacology of the respiratory and circulatory systems.

Hydroxydione is a new drug and may represent the pioneer agent in a new chemical class of intravenously given anesthetics. However, much more clinical experience is necessary before its ultimate place in the armamentarium of anesthesiology can be determined.

Dosage.—Hydroxydione sodium succinate is administered by intravenous injection only, preferably via the antecubital veins. The solution for injection should be freshly prepared from the dry powder to make a solution no more concentrated than 1% (10 mg. per cubic centimeter). The calculated dose is then injected at a rate of 250 mg. (25 cc. of a 1% solution) per minute into the tubing of a rapidly running intravenous solution (isotonic sodium chloride solution or 5% dextrose in water for injection).

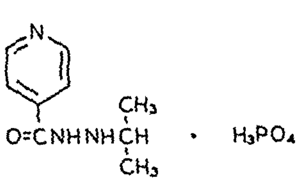
The total initial dose varies from 500 mg. to 1.5 Gm. (50 to 150 cc. of a 1% solution), depending on the weight of the patient, his level of apprehension, and the contemplated duration of the surgical procedure. As a guide to total dosage in adults, 500 mg. will produce an effect for about 30 minutes; thus, for a one-hour procedure, a dose of 1 Gm. of hydroxydione is used. Dosage should be reduced somewhat for geriatric patients. For children between 6 and 12 years of age, the initial dose should not exceed 500 mg. (50 cc. of a 1% solution). General use in children under 6 years is not considered advisable at this time.

Preparations: powder (injection) 500 mg.

Applicable commercial name: Viadril.

Pfizer Laboratories, Division of Chas. Pfizer & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of hydroxydione sodium succinate.

Iproniazid Phosphate.—1-Isonicotinoyl-2-isopropylhydrazine phosphate.—The structural formula of iproniazid phosphate may be represented as follows:



Actions and Uses.—Iproniazid is the isopropyl derivative of isoniazid and, like isoniazid, has tuberculostatic activity. It has been used for the chemotherapy of tuberculosis, particularly in infections of the bones and joints. Because of various side-effects, notably toxic psychoses and manifestations of central nervous system stimulation, the use of the drug as a tuberculostatic agent is now generally discouraged. At the present time, the main therapeutic interest in iproniazid stems from its ability to change (usually in the direction of improvement) the mood and behavior of patients with some types of mental depression.

Iproniazid may be characterized pharmacologically as a central nervous system stimulant of the psychomotor type, although its actions differ in a number of respects from those of the amphetamines. The drug is a potent and irreversible inhibitor of monoamine oxidase, an enzyme involved in the metabolism of epinephrine, levarterenol (norepinephrine), serotonin, and other physiologically active amines. Increases in the concentration of these amines can be demonstrated in the brains of experimental animals after administration of large doses of the drug. The clinical significance of these observations is uncertain, and, at present, the precise mechanism of action of iproniazid is unknown. The drug potentiates other centrally acting drugs, both depressants and stimulants, presumably by interfering with their metabolism in the liver. Although it has a slow onset of action, iproniazid is a cumulative drug with a prolonged effect. Its metabolic fate is not completely understood; however, the isonicotinic acid moiety of the administered drug is known to be excreted in the urine.

The principal therapeutic indication for iproniazid is in the treatment of psychotic patients with moderate to severe depressions. Even though all patients do not respond favorably, current evidence suggests that the drug may improve behavioral patterns without inducing artificial euphoria in some cases. Reported salutary effects include a feeling of well-being and increased vitality, decrease in psychomotor retardation, enhanced ability and/or desire to communicate, and, in some severely withdrawn patients, a return to useful functions. Schizophrenic patients, including those with catatonia, have been reported as not benefited by iproniazid; symptoms may, in fact, be intensified if the drug is administered during the acute phases of the disease. The drug has been of little value in depressed patients with organic brain syndrome. There is some evidence that younger patients seem to respond better than those in the older age group. In general, therapy with iproniazid is best reserved for those depressed patients who have not responded to milder central nervous system stimulants such as amphetamine or methylphenidate. Most authorities also advocate an adequate trial of electroshock therapy before initiating iproniazid medication. It should be borne in mind that, since the response to iproniazid is slow, therapy should be continued at least two months before being considered unsuccessful. Because of its toxicity, iproniazid should not be employed for the treatment of mild, psychoneurotic depressive states.

Increase in appetite and consequent weight gain have been observed in many psychiatric patients during therapy with iproniazid, presumably the result of improved mental status rather than an inherent property of the drug. Although these effects may be desirable in emaciated, debilitated, or chronically ill patients, there is no justification for the employment of iproniazid in underweight, but otherwise normal, patients solely as an aid to weight gain.

Iproniazid produces a wide variety of side-effects and untoward reactions, some of which are serious. The physician using this drug should carefully weigh the advantages to be gained against the risks involved. If the indications for therapy are not clear, the drug should not be given. Although iproniazid has been called a "psychic energizer,' this term carries with it unsound and potentially dangerous psychological implications from the standpoint of self-medication. The definite incidence of untoward mental symptoms produced by the drug places it in a different category than caffeine or amphetamine. The wise physician will therefore refrain from indiscriminate prescription use of the drug.

Among the more frequent side-effects to iproniazid are unwanted psychological reactions, ranging in severity from minor inappropriateness in behavior, hyperactivity, and exaggerated dreams to personality changes which may be frankly psychotic. These effects seem to be reversible when the drug is withdrawn. The drug also produces a number of side-effects referable to autonomic disturbance. Among these (not necessarily in order of frequency) are postural hypotension, constipation, dryness of the mouth, diaphoresis, blurring of vision, urinary hesitation, impotence, and palpitation. Postural hypotension, in particular, may be sufficiently frequent and troublesome to require reduction of dosage or cessation of therapy. Administration of pressor amines is apparently of little value in overcoming this orthostatic type of hypotension. Neurological side-effects may also complicate therapy with iproniazid. These include hyperreflexia, clonus and tremors, paresthesias, peripheral neuropathy, vertigo, dizziness, syncope, and muscular weakness. Miscellaneous side-effects to the drug include peripheral edema (chiefly of the ankles and thighs), gastric upsets, anorexia, dyspnea, and abdominal pain. Mild hypochromic anemia sometimes occurs early in the course of therapy with iproniazid. Although this has been self-limiting, the physician using the drug should perform periodic peripheral blood cell counts, keeping in mind the possible subsequent appearance of more serious hematological effects.

The most serious toxic effect referable to therapy with iproniazid is the development of jaundice. The exact incidence of this complication is unknown although it is probably quite low. Nevertheless, the appearance of jaundice must be regarded as an ominous sign, since this may be followed by fulminating hepatitis which can be fatal. In fatal cases, the hepatitis has been sudden in onset with a rapidly downhill course. Postmortem examination of the liver in several of these patients has revealed pathological changes indistinguishable from acute viral hepatitis. It follows, therefore, that iproniazid is absolutely contraindicated in patients with either a history or the presence of jaundice, liver disease, or impaired hepatic function. Periodic liver-function tests are mandatory during therapy with this drug.

Iproniazid should not be given to patients who are overactive, overstimulated, or agitated. It is probably contraindicated in epileptic patients. The drug should be used cautiously and in low doses in patients with impaired kidney function in order to prevent accumulation. Because iproniazid potentiates the action of certain other drugs, particularly alcohol, ether, barbiturates, meperidine, cocaine, procaine, and phenylephrine, it should be used with great caution whenever these drugs are employed. The relatively high incidence of postural hypotension, with the attending danger of fractures and lacerations from falls, makes the use of the drug particularly hazardous in geriatric patients.

Dosage.—Iproniazid phosphate is administered orally. As with other potent drugs, dosage should be adjusted to the individual patient. Since the drug has a cumulative action, the lowest effective dose should be employed at all times. Symptoms attributable to withdrawal of iproniazid have been reported to occur within 48 hours after cessation of therapy which has been continued for several weeks. These symptoms include headache, exaggerated dreams, vertigo, nervousness, hyperreflexia, irritability, insomnia, and depression. For this reason, the drug should be withdrawn gradually unless other manifestations of toxicity demand sudden cessation of therapy.

The initial dose for nontuberculous conditions should not exceed 1 mg. per kilogram of body weight a day, given as a single dose. Dosage should then be reduced rapidly to lower maintenance levels of 0.2 to 0.5 mg. per kilogram of body weight daily or every other day until discontinuance of therapy becomes feasible.

Preparations: tablets 10, 25, and 50 mg.

Applicable commercial name: Marsilid Phosphate.

Hoffmann-LaRoche, Inc., cooperated by furnishing scientific data to aid in the evaluation of iproniazid phosphate.

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TEEN-AGE CLINICS

THERE IS a growing appreciation of the fact that teen-agers have special problems which deserve more attention than they customarily receive. As children these patients were taken to a pediatrician for a routine checkup but as teen-agers they are apt to feel equally out of place surrounded by infants in the office of a pediatrician and surrounded by adults in the office of an internist or general practitioner. For this reason a teen-age clinic was established in Boston in 1952[1] and because of its success others have been or are being started. Gallagher[2] believes that the reason so little attention has been given to teen-agers as a special group has been their generally low morbidity and death rate and the fact that they fall in between the chief interest of the pediatrician and that of the internist. It is characteristic of the adolescent that he is striving for independence, social acceptance, and recognition as an individual who is no longer a child while at the same time clinging to the security enjoyed as a child.[3]

One of the first aims of the teen-age clinic is to build a strong rapport between physician and patient based on mutual understanding and respect. The patients whose ages are 12 to 21 may choose a male or female physician and once chosen they continue to see that physician as long as they attend the clinic. Should the advice of an allergist or other specialist be necessary this may sometimes be obtained by reviewing the case history without the presence of the patient. If the patient must be seen he is seen by the consultant, the first time at least, in the clinic and in the presence of the referring physician. There are no subclinics in the teen-age clinic. Even the magazines and other furnishings in the waiting room are chosen with teen-age interests in mind.

Although the birth, developmental, and family history are usually obtained from a parent, the rest of the history is obtained from the patient. This and the physical examination are accomplished without the presence of a parent. This fact and the fact that examinations and recommendations are given to the patient rather than the parent help to establish the patient as a person and greatly facilitate treatment by overcoming resistance which can otherwise be a great stumbling block. The emphasis throughout is on the patient as an individual, not on the disease. Careful records of changes in stature and development are made not only as a clue to the patient's problems but also because of the great importance the teen-ager attaches to these changes. Because of the adolescent's lack of knowledge and curiosity about these matters much time is spent explaining normal variations often to the great relief of the patient. Unless extremely atypical, size makes little difference to the child or the adult but it is highly important to the teen-ager not to be too short or too tall, too fat or too thin, too advanced or too delayed in the development of the secondary sexual characteristics. Teen-agers have a sudden release of unbounded energy. They no longer just play around as do children nor do they just sit around as do adults. They go at things hard. They are mixed up, confused, and bewildered and to an adult usually make very little common sense.

Teen-age clinics are not only serving a formerly neglected group of patients, they are accumulating new knowledge about the medical problems of teen-agers. Because vast numbers of teen-agers are still under the care of general practitioners, pediatricians, and internists, these clinics offer training to members of these groups not so that they may become specialists in this field but so that in their own setting they may have a better understanding of the problems of adolescents. The physician anywhere who can convince a teen-ager that he is interested in his or her problems, no matter how trivial from a medical standpoint, is not only helping a patient, he is helping a young person through a difficult period and assisting a mentally and physically healthy individual in adjusting to a better adult life.

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1. Gallagher, J. R.: Clinic for Adolescents, Children 1:165-170 (Sept.-Oct.) 1954.

2. Gallagher, J. R.: The Adolescent and Pediatric Education, Pediatrics 19:937-939 (May) 1957.

3. Roth, A.; Weissman, A.; and Linden, C.: Plan for Medical Care for Adolescents, Pediatrics 18:86-89 (July) 1956.

COMPULSORY PREMARITAL BLOOD TESTING

Last year THE JOURNAL carried an editorial[1] calling for careful epidemiologic studies to either confirm or refute the value of the compulsory premarital blood test for syphilis. This year one of the first of no doubt many such studies to come, has been published. The new report[2] states, "The statistical evidence suggests that, at least during the last decade, the mortality and morbidity from syphilis were not influenced greatly by the compulsory premarital blood test. The tremendous declines observed seem attributable to other factors such as intensified case finding, the wide-spread examination and treatment of pregnant women and particularly to improved therapy with penicillin."

Of the newly reported total cases of primary and secondary syphilis in the United States in 1956 (which do tend to show a slight rise over 1955), 459 cases came from the state of South Carolina alone. The Chief of the Venereal Disease Section of that state, however, attributes the sharp rise primarily to intensified case finding programs.

The authors of the new report on whether premarital blood tests should be compulsory feel the most dependable statistical measures to show the decline of syphilis are (1) the rate of mortality from syphilis in infancy and (2) the reported morbidity from syphilis in the primary and secondary stages. They feel these two indexes are least affected by the distortions that result from multiple reporting and prevent errors based on the late effects of syphilis contracted many years ago. During the entire period from 1910 until the present, the syphilis mortality of infancy dropped from 131.4 to less than 1.0 per 100,000 infants, a decline of more than 99%. During the year 1955, 29 states reported not a single death from syphilis in infancy. As to morbidity, the reported case rates from primary and secondary syphilis, all ages, although subject to the vagaries of case reporting, have also declined rapidly. The case rate per 100,000 in 1946 was 70.94 as compared to 4.16 ten years later.

According to the two epidemiologic statistical methods cited above, the percentage decline has occurred about equally in all states regardless of whether they have a compulsory premarital blood test law. Furthermore, the test reveals so few infectious cases of syphilis as to make it an unproductive method of case finding as well as an enormously expensive one.

Of even greater importance is the false-positive reaction to the serologic blood test. In a so-called high prevalence group (one which would be expected to have relatively few biologic false-positive reactors) 12% with a positive standard serologic test had negative reactions to the Treponema pallidum complement-fixation test. The impact of a false label of syphilis must always be emphasized, and a strong word of caution is sounded against the damage that can result from an increased proportion of false-positive reactions.

Every physician is directly involved with legislation concerning compulsory blood testing. The subject matter in this editorial, however, pertains solely to premarital compulsory blood testing. When it comes to prenatal blood testing, failure to recognize the presence of a syphilitic infection in a pregnant woman and failure to treat her, with a resulting stillbirth, could lead to a lawsuit. Because syphilis has such an effective treatment (sometimes accidentally treated through penicillin therapy for a nonvenereal infection) the private physician and the public health official have enjoyed tremendously improved cooperation in controlling this disease. The private physician should now assume the additional responsibility of weighing the penalties (e. g., false-positives) of premarital compulsory blood testing against the benefits for our population, and he should not hesitate to express his clinical impressions to the proper authorities. As demonstrated by the reported findings in South Carolina, our excellent record should not cause us to become smug, but should convince us that vigilance has paid off.

MEDICINE AND LABOR

Elsewhere in this issue of THE JOURNAL (page 290) is a brief report on a recent meeting between representatives of medicine and labor. One of the largest labor organizations in the nation, the International Ladies' Garment Workers' Union, played host in August to leaders of medicine at a conference on "third parties" in medical service. This union has a yearly health and welfare budget of 30 million dollars. The purpose of the meeting was to permit physicians and union leaders to meet, comment on their respective positions, exchange ideas, and explore areas of mutual interest with the hope that from such a meeting would come opportunities for the future. More such conferences will be held in the weeks to come, both at the local level in Pennsylvania and other states and at the national level in Chicago. Already the A.M.A. Council on Medical Service has developed plans for an informal conference in October with medical directors of 10 medical care programs sponsored directly or indirectly by labor groups. The purpose of this and future scheduled sessions with other "third parties" is to explore general principles and policies which may be applied to the relationships between members of the medical profession and other interested groups. Obviously "third parties" in the field of medical service is a topic that falls within this general field.

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[1] Compulsory Blood Testing, editorial, J. A. M. A. 163:551 (Feb. 16) 1957.

[2] Hedrich, A. W., and Silverman, C.: Should Premarital Blood Test Be Compulsory? Am. J. Pub. Health 48:125-132 (Feb.) 1958.

ORGANIZATION SECTION

MEDICINE MEETS WITH LABOR

> Our human needs and values go beyond the aims of trade unionism. We are interested in the same things you are—extension of life. It is the job of the union to promote health consciousness. This is as important, if not more important, than higher wages and better working conditions.

With the above comment David Gingold, vice-president of the International Ladies' Garment Workers' Union, welcomed more than 100 physicians and union representatives, Aug. 26, at Unity House, an ultramodern resort which the ILGWU operates at Forest Park, Pa. It was the ILGWU which, in 1913, established the first union health center in the United States.

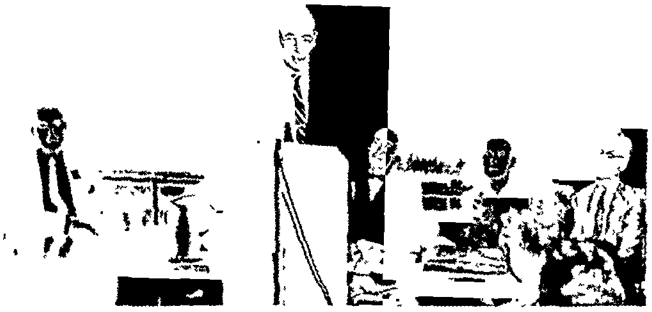
Among those invited by the union to the two-day conference on "The Third Party and Organized Medicine" were physicians and laymen from the labor organization's far flung medical centers and selected leaders from every level of organized medicine. Representing the American Medical Association was Dr. James Z. Appel of Lancaster, Pa., a member of the Board of Trustees. Included among the guests were Dr. Norman Welch of Boston, vice-speaker of the A. M. A. House of Delegates; Dr. Ernest B. Howard of Chicago, Assistant Executive Vice-president of the A. M. A.; and officials of medical associations from Massachusetts, Pennsylvania, New Jersey, and Philadelphia.

At the close of the conference, at which differing viewpoints were expressed alongside statements of cordiality, it was announced that similar meetings at local levels would be held by various ILGWU and medical society representatives in Pennsylvania beginning this month. The stated purpose of the conference was not to resolve any specific differences between organized medicine and organized labor but, rather, in the words of the union, "to explore in a constructive fashion the issues which have arisen with the advent of the so-called 'third party' in the field of medical care." (A meeting called by the A. M. A. Council on Medical Service with a similar goal is scheduled for next month [October] in Chicago. This will be an informal session with medical directors of 10 medical care programs sponsored directly or indirectly by labor groups.)

Following are excerpts from papers delivered at the Unity House conference and also some selected comments made by participants and guests during periods for free discussion:

Gus Tyler, director of the ILGWU Training Institute: "We are concerned with the whole man in the community, just as medicine is so concerned."

Dr. Appel: "Since most third parties are in reality primarily financial organizations they might for financial reasons select poorly qualified and cheap physicians to render medical care to their beneficiaries in order to save money. . . . Money paid into a union health fund belongs to the worker. He is the one who should designate how it is used, to whom it should be paid, and to what extent. . . . The American Medical Association at this time believes that the patient should have the reasonable right to select his or her own physician from among all physicians who are qualified and willing to render the type of medical care indicated. . . . The ability of the physician and the evaluation of medical service rendered cannot be determined by accounting procedures, I. B. M. machines, electronic brains. The medical profession believes that it and it alone is qualified to perform this job. Organized medicine is sincere in its desire to perform this function of policing itself."



Dr. James Z. Appel, a member of the A. M. A. Board of Trustees, addresses physicians and union representatives at meeting sponsored by International Ladies' Garment Workers' Union. At far left is Dr. Caldwell Esselstyn. Listening at right are ILGWU officials Adolph Held and Louis Rolnick and Dr. Herbert Abrams.

Agnes Brewster, medical economist of the Social Security Administration: "Third party payments are part of the fabric of our times. Moving together in the space age can best be accomplished if the parties of the first and second part understand each other so that the party of the third part can do a satisfactory job of bringing the other two together."

John Tomayko, director of welfare and pensions for the steelworkers' union: "I don't think that free choice of physician exists today. A patient simply goes to his neighborhood doctor to get care."

Dr. Samuel B. Hadden, Philadelphia psychiatrist: "When people are sick they are sick in spirit, too. They cannot, like cattle, be treated on a mass production line basis."

Dr. Caldwell Esselstyn, director of Rip Van Winkle Medical Clinic, Hudson, N. Y.: "He who pays the piper has a right to call the tune. . . . Some sort of government regulation is necessary in the health insurance field."

Dr. William B. Harer, member of the Board of Trustees of the Medical Society of Pennsylvania: "A small minority of doctors rest on their laurels after licensure and seldom read medical magazines or attend medical meetings. Organized medicine has no responsibility to provide economic security for such doctors by insisting upon their inclusion in health and welfare fund programs. The medical profession now recognizes the necessity for strict, impartial action against nonconforming doctors. We also recognize that varying degrees of training, experience, skill and competence exist among our members. . . . The medical profession is not demanding completely unlimited, unrestricted free choice. To do so would be very unrealistic. . . . I suggest that unions be completely honest by adopting the following course of action: When the total revenue available to a health and welfare fund has been determined, find out from insurance underwriters what medical services such an amount of money will purchase for the total number of eligible participants, and then under free choice make these services available in a way that will be used by all members and their eligible dependents."

Dr. Herbert K. Abrams, Medical Director of Union Health Center, Inc., Chicago: "Medicine is no longer a mystic undifferentiated art, in which the appellation of 'Doctor' evokes a picture of equal ability for all who have the title. Health education has begun to reap results. The public is beginning to ask for the same things in medical care which we as a profession have always subscribed to. . . . We physicians cannot afford to be destructive. Let us nourish our scientific curiosity. Let us all have, not merely tolerance for new solutions to improve medical care, but let us be constructively enthusiastic to new ideas. More than this, let us as the medical profession provide the leadership which society expects of us in solving the problems of adequate distribution of medical care."

Martin Moran, an ILGWU representative from Harrisburg, Pa.: "Before George Meany took over, we always had a pat answer to charges of corruption, racketeering or communism in any union. The answer was one word: autonomy. It was a poor excuse. Perhaps if a medical society is acting improperly, 'autonomy' also should not be used by the medical profession as an excuse. Perhaps the A. M. A. needs a George Meany."

Dr. Leo Price, director of the ILGWU Union Health Center in New York City: "Industry is allocating one and a half billion dollars a year to health and welfare funds. They have developed a market for medical care that certainly will affect the trends in medical service for a long time to come."

Dr. Edgar W. Meiser, former chairman of the committee on medical economics of the Medical Society of the State of Pennsylvania (recalling the start of the mine workers union health and welfare program in 1946): "Medicine, with its heritage of idealism, and labor with its cold, calculated realism met on unfamiliar grounds with an inherited mutual malignant distrust. Obviously, no rules of conduct had been agreed upon before this conflict began, and we both—labor and medicine—erected our first milestone of stupidity. In retrospect, one must wonder if there had been a conference held in an atmosphere of respect and attempted understanding, whether mutual agreement of conduct could have been reached, and this present intolerable situation could have been avoided."

Adolph Held, director of the ILGWU Welfare and Health Benefits Department (at the close of the conference): "To all of you let me relay some fine advice given many years ago by a wise labor leader: 'The greatest problem after a big strike is calming the pickets.'"

OPTOMETRISTS WANT AMENDMENT TO SOCIAL SECURITY ACT

June 28, 1958

The Honorable Wilbur D. Mills, Chairman
House Committee on Ways and Means
House of Representatives
Washington 25, D. C.

Dear Mr. Mills:

During the hearings just concluded on social security, the American Optometric Association urged an amendment to the Social Security Act as follows:

"It is hereby declared to be the intent of Congress that the services of all duly licensed practitioners within the scope of their practice as prescribed by the laws of the jurisdiction in which the service is rendered shall be made available to all beneficiaries or recipients of federal aid and to that end the term 'health care' shall hereafter be deemed to supersede the term 'medical care,' save and except where the service to be rendered can only be performed by a duly licensed physician."

The American Medical Association believes that the enactment of such an amendment would not be in the public interest. In fact, we believe the language in existing law which permits optometrists to make determinations of blindness is contrary to the public interest.

It is the position of our Association that Title X, Section 1002 (a) (10) should be amended by deleting from such subsection the words "or by an optometrist, whichever".

To grant optometrists the right to make examinations for determining blindness may result in a failure to ascertain the cause of blindness and thus prevent the administration of necessary medical rehabilitative care. The application of medical skills by a doctor of medicine will, *in many cases*, insure the detection and successful treatment of the organic and systemic causes of blindness. Unfortunately for the patient, such diagnosis and treatment cannot be provided by optometrists.

It is my hope that this statement can be made a part of the records of your hearings.

Sincerely yours,
F. J. L. BLASINGAME, M.D.
Executive Vice-president

August 11, 1958

The Honorable Harry F. Byrd
Chairman, Committee on Finance
United States Senate
Washington 25, D. C.

Dear Senator Byrd:

On Friday, August 8, 1958, the American Optometric Association urged an amendment to the Social Security Act as follows:

"The Congress hereby declares that it is in the public interest that the services of optometrists should be available to beneficiaries of health programs financed in whole or in part by funds appropriated from the Treasury of the United States. Nothing in this act or in any other Act authorizing health programs shall be construed to exclude the utilization of the services of optometrists within the scope of their practice as prescribed by the laws of the jurisdiction in which the service is rendered."

The representatives of the Optometric Association also incorporated by reference an amendment offered before the House Ways and Means Committee and further stated:

"Both amendments we believe to be in the public interest and are willing to abide by the decision of this Committee as to which one is preferable."

The American Medical Association does not believe that either of these proposals are in the public interest or that they are the only alternatives open to the Committee. We do not believe that proposals which would, by one stroke of the pen, amend all federal statutes dealing with medical care should be considered lightly or be the subject of only two days of hearings. We believe that the federal agencies involved and the public at large should be given an opportunity to study the consequences and to express an opinion.

The American Medical Association therefore recommends that the Senate Finance Committee follow the example of the House Ways and Means Committee by rejecting these proposals. We also urge that the Senate Finance Committee go one step further and amend Title X, Section 1002(a)(10) by deleting from such subsection the words "or by an optometrist, whichever."

The granting to optometrists the right to make examinations to determine blindness may result in a failure to ascertain the cause of blindness and thus prevent the administration of necessary medical rehabilitative care. Unfortunately, in too many cases proper treatment has been delayed or possible rehabilitation or cure denied because of diagnoses rendered by others not qualified as medical practitioners. On the other hand, the medical skills possessed by physicians have resulted in the detection and successful treatment of the organic and systemic causes of blindness.

It is my hope that this statement can be made a part of the record of your hearings.

Sincerely yours,
F. J. L. BLASINGAME, M.D.
Executive Vice-president

VETERAN DELEGATE TO RETIRE

Dr. Walter E. Vest of Huntington, W. Va., who has served as one of the two A. M. A. delegates from that state since 1934, will retire after the A. M. A. Clinical Meeting in Minneapolis in December. During his tenure of office as a member of the A. M. A. House of Delegates, he has not missed a roll call. The annual meeting of the West Virginia State Medical Association in White Sulphur Springs, Aug. 21-23, was the 40th consecutive annual state meeting which he has attended.

Doctor Vest will continue as editor of the *West Virginia Medical Journal*, an office he has held since 1937. He is a past-president of the West Virginia State Medical Association and of the Southern Medical Association and is now a member of the Council on Constitution and By-Laws of the A. M. A.

Dr. Charles A. Hoffman, also of Huntington, immediate past-president of the West Virginia State Medical Association, was named by the House of Delegates as A. M. A. Delegate to succeed Doctor Vest. He will take office on Jan. 1, 1959.

CHANGE OF ADDRESS

If you change your address please notify THE JOURNAL at least six weeks before the change is made. Include the address label clipped from your latest copy of THE JOURNAL, being sure to clearly state both your old and new address. If your city has Postal Zone Numbers, be sure to include this Zone Number in your new address.

MEDICAL NEWS

CALIFORNIA

Psychiatric Meeting in Los Angeles.—The fifth annual meeting of the Southern California Psychiatric Society, a Branch of the American Psychiatric Association, will be held Oct. 4 at the Hotel Statler, Los Angeles. The morning program will consist of workshops concerning the various phases of psychotherapy. The afternoon program will be devoted to papers presented by authorities in psychiatry. There will be an evening dinner dance. For information write the Southern California Psychiatric Society, 427 N. Camden Drive, Beverly Hills, Calif.

University News.—A portrait of Dr. Karl M. Bowman, professor of psychiatry, emeritus, at the University of California Medical Center, San Francisco, and retired medical superintendent of the Langley Porter Neuropsychiatric Institute, has been presented to the university, the gift of a group of the psychiatrist's friends and colleagues. Dr. Bowman was named chairman of the University of California department of psychiatry in 1942 and officially retired in 1956.

COLORADO

Annual State Meeting in Colorado Springs.—The 88th annual session of the Colorado State Medical Society will be held at the Broadmoor Hotel, Colorado Springs, Sept. 24-27. The presidential address will be given the afternoon of Sept. 25 by Dr. John Zarit, Denver, after which an Institute on Alcoholism will be held, moderated by Dr. Marvin A. Block, Buffalo, N. Y., chairman, Committee on Alcoholism, Council on Mental Health, American Medical Association. Papers to be presented at the general session include "What Anesthetic Drug Shall I Use Today?," by Dr. Charles R. Stephen, Durham, N. C., and "The Staff Physician and the Hospital Pharmacist," by Samuel H. Kohan, B.S., Denver. A panel discussion on "Problems of Hemorrhage from the Gastro-Intestinal Tract" will be moderated by Dr. Harold D. Palmer, Denver. Guest speakers include the following: Sheldon D. Bacon, Ph.D., New Haven, Conn.; and Drs. Marvin A. Block, Buffalo, New York City; Robert E. Fleming, Boston; Harold E. Himwich, Galesburg, Ill.; John B. Miale, Miami; Merle M. Musselman and Jackson A. Smith, Omaha; Louis E. Prickman, Rochester, Minn.; George E. Shambaugh Jr. and Hyman J. Zimmerman, Chicago; and William W. Scott, Baltimore. Question-and-answer and discussion periods and exhibits are planned. Entertainment includes a program of sports Sept. 24.

IDAHO

Regional Physicians Meeting at Sun Valley.—The first regional meeting of the American College of Physicians in Idaho will be held Sept. 27 in the Challenger Inn, Sun Valley, for the Idaho-Utah region. The meeting will be preceded by a meeting of the Idaho Society of Internal Medicine Sept. 26. Dr. Richard P. Howard, of Pocatello, governor of the college for Idaho, will present an address to open the meeting, and Dr. Theodore C. Bauerlein, Salt Lake City, governor for Utah, will preside at the afternoon session. Papers by invited speakers include:

Mechanisms Controlling Blood Pressure with Emphasis on Hypotension, Dr. Fred W. Clausen, Salt Lake City.
Doriden Intoxication Treated with the Artificial Kidney, Dr. George D. Gross, Salt Lake City.
An Approach to Blood Coagulation Problems, Dr. Stanley J. Altman, Salt Lake City.

Principal speaker of the evening will be Dr. Chester S. Keefer, Boston, regent of the college. For information write the American College of Physicians, 4200 Pine St., Philadelphia 4.

ILLINOIS

Hines Medical Chief Takes Post in Manila.—According to the *Chicago Tribune*, Dr. Lyle A. Baker, chief of medical services at Hines Veterans Hospital, near Maywood, is leaving the Veterans Administration to become chief medical advisor for the Philippine Memorial Hospital in Manila. Dr. Baker, a World War II medical officer, has been at Hines since 1941 and with the VA for 27 years. He is a diplomate of the American Board of Internal Medicine and associate professor of clinical medicine at the University of Illinois. Dr. and Mrs. Baker were guests at a farewell dinner at the Elmhurst Country Club, before leaving for Manila Sept. 1.

Personal.—Dr. Frederick M. F. Meixner, the first medical director of the Peoria Municipal Tuberculosis Sanitarium and former member of the board of directors of the National Tuberculosis Association, has received the Alma B. Fringer memorial award from the Illinois Tuberculosis Association for "outstanding service in the field of tuberculosis."

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

——Dr. Leland E. Powers joined the staff of the Association of American Medical Colleges as associate director July 1. Dr. Powers has been director of the School of Public Health and associate dean of the Faculty of the Medical Sciences, American University of Beirut, Lebanon, since 1954.

Chicago

Organize Speakers Bureau.—The Chicago Medical School has organized a speakers bureau and will provide faculty members to speak on medical topics, or on the history and objectives of the school. The speakers' subjects cover a variety of scientific subjects, particularly on allergies, metabolism, pediatrics, heart disease, leukemia, cancer, the Rh factor, psychiatry and psychology, gynecology and obstetrics, medicine and religion, medicine as a social science, child-parent relationships, tuberculosis, arthritis, and other areas of medicine and surgery. Inquiries regarding speakers should be addressed to the Speakers Bureau, The Chicago Medical School, 710 S. Wolcott Ave., Chicago 12.

Society News.—The officers of the Chicago Laryngological and Otological Society for 1958-59 are: president, Dr. J. Allan Weiss and secretary-treasurer, Dr. Marvin F. Austin, 700 N. Michigan Ave., Chicago 11.——At the annual meeting of the Chicago Gynecological Society, June 20, the following officers were elected: president, Dr. Henry C. Hesseltine; president-elect, Dr. Clyde J. Geiger; vice-president, Dr. Alfred J. Kobak; secretary, Dr. William G. Cummings (Evanston); assistant secretary, Dr. Edward S. Burge (Evanston); and treasurer, Dr. Walter F. Dillon.

Information for Parents on Hearing.—An information series for the parents of young deaf children, sponsored by the Advisory Committee on Hearing Conservation and Rehabilitation of the Illinois Commission for Handicapped Children, will be held at the Chicago Hearing Society, 30 W. Washington St., Room 619, on six successive Wednesdays, 7:30 to 9:00 p. m., Oct. 22 through Dec. 3. The series is designed to give parents information necessary to understand the handicap of deafness and to help their child in his early critical years. Speakers will include physicians, teachers, and technicians. This series is open to parents or relatives of young deaf children under 6 years of age living in the Chicagoland area. Admission is by referral only from the family otologist, pediatrician, public health department, or speech and hearing clinic where the child is known. Applications may be obtained from the Commission for Handicapped Children, 160 N. LaSalle St., Chicago; telephone FInancial 6-2000, Ex. 835.

IOWA

General Practice Meeting in Des Moines.—The Iowa Chapter of the American Academy of General Practice will hold its annual meeting at the Savery Hotel, Des Moines, Sept. 21-23, with the annual business meeting scheduled for Sept. 21, 3 p. m. The program includes the following out-of-state speakers: Drs. Joseph G. Molner, Detroit; Priscilla White, Boston; Francis D. Murphy, Milwaukee, Wis.; Clark H. Millikan, Rochester, Minn.; Nelson W. Barker, Rochester, Minn.; and Bruce Chown, Winnipeg, Manitoba, Canada. Luncheon addresses will be given by Dr. Jack McKenty, Winnipeg, and Mr. Loren Hickerson, executive secretary, State University of Iowa Alumni Association, Iowa City. Twelve hours of category I credit will be granted to A. A. G. P. members who attend both days of the scientific sessions. The annual banquet will be held Sept. 22.

NEW YORK

Rabies in Oswego County.—The New York State Health Department has certified Oswego County as one where rabies exist, Dr. Herman E. Hilleboe, state health commissioner, has announced. Under the state public health law, the certification places a quarantine on all dogs, whether or not they are vaccinated against rabies. No dogs can legally be at large in Oswego County. Dr. Hilleboe said that following two years during which no cases of rabies were reported in the county, three cases of canine rabies have been reported this year. There are about 13,000 dogs in Oswego County. A total of 109 cases of rabies in New York State has been reported this year, as compared with 141 for the first eight months of 1957. Of the eight cases of canine rabies reported, three have occurred in Oswego and three in Madison counties. Madison County has been certified since 1949. The other rabies incidence this year has been as follows: fox, 34; bovine, 43; and other animals, 24. The certification of Oswego County reportedly will continue until the threat has passed, and the quarantine can be removed for vaccinated dogs if 70% of the dogs in the county are vaccinated.

New York City

University News.—The Lord Cohen of Birkenhead has been appointed visiting professor of medicine at the State University of New York Downstate Medical Center in Brooklyn for the period Sept. 10 to Sept. 30. He is a senior physician at the Royal Infirmary in Liverpool and chairman of the Standing Medical Advisory Committee of the Ministry of Health.

Center for Service to Handicapped.—New York University has created a Center for Rehabilitation Services to coordinate and broaden the institution's programs for the handicapped. The center will be an intrauniversity agency within the office of the university's executive vice-president, John E. Ivey Jr., Ph.D. Individual schools and colleges will continue to operate rehabilitation programs independently, with the center acting as an over-all coordinating and planning office. A director of the center has not yet been appointed. The university's activities in rehabilitation include the Institute of Physical Medicine and Rehabilitation at the NYU-Bellevue Medical Center, the training of personnel in adapted physical education and recreation for the handicapped within the School of Education, prosthetic research in the College of Engineering's research division, the development of a cleft palate clinic at the College of Dentistry, and clinical services offered by the psychology department. Conducting related service programs are the Reading Institute and the Testing and Advisement Center in the Division of General Education. Several units of the university have undertaken activities in preretirement counseling and other services concerned with aging.

OHIO

Fellowships for Research in Central Ohio.—Graduate students, physicians, and investigators interested in heart research are invited to apply for fellowships available from the Central Ohio Heart Association. Research grants are made to nonprofit institutions in direct support of a particular investigator. Prospective investigators must apply for a specific program of research under their direction. Grants are awarded in support of research in the cardiovascular field or basic sciences related to it for periods of a year or more. The association is also taking applications for fellowships for research and training at Central Ohio institutions. Fellowships are available for one year and carry an annual stipend of from $4,800 to $7,000 a year. Basic science fellowships are open to those with a bachelor's degree in a basic science, graduate students, or trainees in qualified research institutions. Fellows must engage in full-time basic science research related to cardiovascular disease. A clinical fellowship is open to those with an M.D. and two years' residency. Work may be conducted in any properly qualified hospital in the Central Ohio area. The clinical Donald Mahanna fellowship is also open with the work being conducted at the Heart Station, University Hospital, Columbus. The stipend is $7,000 a year. Deadline for grant-in-aid applications is Nov. 1 for fellowships starting July 1, 1959. For applications write the Central Ohio Heart Association, 50 E. Broad St., Columbus.

PENNSYLVANIA

Health-Law Center in Pittsburgh.—The University of Pittsburgh has established a health law center within the Graduate School of Public Health with John F. Horty Jr., attorney from Johnstown, the director. The purpose is "to pursue, on a sustaining basis, studies concerning the legal aspects of medicine, dentistry, nursing, public health, hospitals and medical care." The center will undertake a long-range program of research and teaching and will establish a clearinghouse for legislative and other legal materials in the health fields. Since September, 1956, a hospital law research study has been under way at the university. Financial support ($234,528) for this research has been provided by the National Institutes of Health to the program in hospital and medical administration under Dr. John R. McGibony. A research team of six attorneys, two hospital administrators, and staff has been gathering material pertinent to the field of hospital law and is analyzing it; Mr. Horty has served as director of the research study.

Philadelphia

Dr. Ravdin Named University Vice-President.—Dr. Isidor S. Ravdin, John Rhea Barton Professor of Surgery at the University of Pennsylvania, has been appointed vice-president of the university for medical development, following the recent resignation of Dr. Norman H. Topping, who was elected president of the University of Southern California after having served as vice-president for medical affairs at Pennsylvania since 1952. Dr. Ravdin will continue in his capacity as chief of surgery at the Hospital of the University of Pennsylvania and as chairman of the department of surgery. He is also chairman of the board of regents of the American College of Surgeons and president of the American Surgical Association.

PUERTO RICO

Dr. Mandry to Be Honored.—The Sunderman award, presented to "The Clinical Scientist of the Year," will be given to Dr. Oscar Costa Mandry, Santurce, Puerto Rico, at the annual meeting of the Association of Clinical Scientists, New York City, Oct. 11, 6:30 p. m., at The Park Sheraton Hotel. Dr. Frederick W. Sunderman, associate professor of medicine, Jefferson Medical College of Philadelphia, will present the award. "The Development of Clinical Science in Puerto Rico" is the title of Dr. Mandry's award oration.

VIRGINIA

Medical Seminar on Personal Injury Problems.—The Department of Legal Medicine, Medical College of Virginia, and the Virginia State Bar have announced that their two-day Medical Seminar for Lawyers dealing with personal injury problems resulting from trauma, particularly automobile accidents, will be conducted Oct. 17-18 at the Medical College of Virginia, Richmond. The seminar will be limited to 100 attorneys. The program is designed to increase the proficiency of lawyers handling litigation in which medical testimony is involved. A staff of over 25 physicians will conduct the course. For information write Mr. Thomas D. Jordan, Medical Seminar for Lawyers, P. O. Box 41, MCV Station, Medical College of Virginia, Richmond 19, Va.

WASHINGTON

Annual Strauss Lecture.—On Nov. 5, 8:15 p. m., in the Auditorium of the Health Sciences Building, University of Washington, Seattle, Prof. Charles F. W. Illingworth, Regius Professor of Surgery at the University of Glasgow, Scotland, will give the ninth annual Alfred A. Strauss Lecture sponsored by the department of surgery of the university. Professor Illingworth, president of the British Society of Gastroenterology and past-president of the Association of Surgeons of Great Britain and Ireland and the Surgical Research Society, will speak on "The Endocrine Aspects of Breast Cancer."

New Programs for Internship and Residency.—New internship and residency programs will be offered by the University of Washington School of Medicine, Seattle, beginning July 1, 1959, to be centered around the new University Hospital, which expects to receive its first patients next May and will gradually build up to its 300-bed capacity over a period of months. During the build-up period, other Seattle hospitals closely affiliated with the university will be used to give a rounded program of supervised patient responsibility. These are King County, Veterans Administration, and Children's Orthopedic hospitals, with a bed capacity totaling more than 900. The University Hospital will be a teaching and research hospital, staffed by the university faculty and located on the university campus adjacent to the Health Sciences Building. It will feature a large outpatient clinic, a rehabilitation center, an inpatient psychiatric department, and a premature-infant center, in addition to the regular features of a teaching hospital. Twelve internships will be offered. Three will be rotating and nine mixed. Four of the mixed internships will have a major in medicine, four a major in surgery, and one in pediatrics. Intern stipends will be $150 per month plus $30 food allowance. Uniforms and laundry service are free. Housing will be the intern's responsibility. Residencies will be offered in most of the services of the new hospital. Residents will also make use of the facilities of affiliated hospitals. Inquiries should be addressed to Medical Director, University Hospital, University of Washington, Seattle 5.

WEST VIRGINIA

State Medical Election.—Officers elected at the 91st annual meeting of the West Virginia State Medical Association include the following: president, Dr. George F. Evans, Clarksburg; president-elect, Dr. Jacob C. Huffman, Buckhannon; vice-president, Dr. John W. Hash, Charleston; and treasurer, Dr. Thomas M. Barber, Charleston.

Personal.—Dr. William D. McClung, of Richwood, has been appointed by Governor Underwood a member of the West Virginia Board of Health for the nine-year term ending June 30, 1967. The governor also announced the reappointment of Dr. Clark K. Sleeth, of Morgantown, as a member of the West Virginia State Board of Examiners for Practical Nurses. He will serve for a five-year term ending June 30, 1963.——Dr. Paul L. Conrad, of Gary, has left for Dhamton, M. P., India, where he will resume his old post as general superintendent of a 100-bed hospital owned and operated by the Mennonite Church in India. Dr. Conrad's address overseas will be Christian Hospital, Dhamton, M. P., India.——Dr. Everett H. Starcher, of Logan, has been appointed by Governor Underwood a member of the Medical Licensing Board for the five-year term ending June 30, 1963.

Physicians Meeting in Huntington.—The West Virginia regional meeting of the American College of Physicians will be held at the Prichard Hotel, Huntington, Sept. 20. Papers to be presented by invited guest speakers include "Collagen Heart Disease; Report of an Unusual Case," by Dr. Samuel Biern Jr., of Huntington, and "Oral Manifestations of Medical Diseases," by Dr. Clyde Litton, of Charleston. Dr. Charles H. Drenckhahn, of Urbana, Ill., third vice-president of the college, will give highlights of college activities preceding the conclusion of the program, a summary and discussion by Dr. Maurice C. Pincoffs, Baltimore, past-president and regent of the college. At the dinner, with Dr. Paul H. Revercomb, governor for West Virginia, as toastmaster, Dr. Pincoffs will present an address. A ladies' program is arranged. Fee for registration, social hour, and dinner, payable to Dr. William E. Bray Jr., 1016 6th Ave., Huntington, W. Va., is $8.

Postgraduate Institute at Martinsburg.—The third Postgraduate Institute, sponsored jointly by the Eastern Panhandle Medical Society and the West Virginia Chapter of the American Academy of

General Practice, will be held at the Shenandoah Hotel, at Martinsburg, Sept. 27-28. The institute will begin at 9 a. m., Sept. 27, when a surgical program will be presented with a panel discussion to follow. Other sessions will be devoted to medicine, pediatrics, and obstetrics and gynecology. A total of 18 papers are scheduled for presentation. At a luncheon at noon, Sept. 28, Capt. William M. Snowden, M. C., U. S. N., of Washington, D. C., deputy director, Aviation Medicine Operations Bureau of Medicine and Surgery, Navy Department, will speak on "Man In Space." Capt. Maurice M. Witherspoon, Chaplain's Corps, U. S. N. (Ret.), will be guest speaker at the banquet Sept. 27. His subject will be "Let's Live and Like It." Members of the American Academy of General Practice will be granted 12 hours category one credit for two days attendance at the meeting. For information write the General Chairman, Dr. Halvard Wanger, Shepherdstown, W. Va.

Society News.—At the annual meeting of the West Virginia Society of Anesthesiologists the following officers were elected: president, Dr. David A. Haught, Huntington, vice-president, Dr. Logan W. Hovis, Parkersburg, and secretary-treasurer, Dr. Eldon B. Tucker Jr., Morgantown.——The West Virginia Chapter of the American College of Surgeons has installed the following officers: Dr. William D. McClung, Richwood, president, Dr. Kenneth G. MacDonald, Charleston, vice-president, and Dr. Victor S. Skaff, Charleston, secretary-treasurer.——Dr. Seigle W. Parks, of Fairmont, was installed as president of the West Virginia Chapter of the American Academy of General Practice in May succeeding Dr. Halvard Wanger, of Shepherdstown. Dr. Myer Bogarad, of Weirton, who served as vice-president during the past year, was named president-elect and will assume his duties as president at the annual meeting in Charleston next May. Other officers are: Dr. Jerome C. Arnett, of Rowlesburg, vice-president, Dr. James K. Pickens, of Clarksburg, secretary (reelected); and Dr. Don S. Benson, of Moundsville, treasurer (reelected).

GENERAL

Diabetes Week.—The week of Nov. 16-22 will be observed as Diabetes Week. Each year the week which precedes Thanksgiving is the official Diabetes Week as selected by the Council of the American Diabetes Association upon recommendation of the executive committee. Affiliate associations and committees on diabetes detection of county and state medical societies are being urged to note these dates in making plans for development of public education and detection programs.

Postdoctoral Study in Statistics.—Awards for study in statistics by persons whose primary field is not statistics but one of the physical, biological, or social sciences to which statistics can be applied are offered by the department of statistics of the University of Chicago. The awards range from $3,600 to $5,000 on the basis of an 11-month residence. The closing date for application for the academic year 1959-60 is Feb. 16, 1959. Information may be obtained from the Department of Statistics, Eckhart Hall, University of Chicago, Chicago 37.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Aug 23, 1958		Aug 24, 1957
	Paralytic Type	Total Cases	Total
New England States			
Maine	..		2
New Hampshire		3	..
Vermont		..	..
Massachusetts		4	1
Rhode Island			..
Connecticut	2	5	3
Middle Atlantic States			
New York	13	22	22
New Jersey	8	21	8
Pennsylvania	10	12	9
East North Central States			
Ohio	6	19	29
Indiana	4	14	17
Illinois	1	13	42
Michigan	43	85	53
Wisconsin	2	5	25
West North Central States			
Minnesota		4	
Iowa	..	1	8
Missouri	4	7	5
North Dakota	7	11	
South Dakota			2
Nebraska			3
Kansas			8
South Atlantic States			
Delaware	1	1	
Maryland	2	2	2
District of Columbia			7
Virginia	5	7	11
West Virginia	2	9	1
North Carolina	2	4	11
South Carolina		1	1
Georgia		1	8
Florida	3	7	5
East South Central States			
Kentucky	1	1	7
Tennessee	3	5	6
Alabama			2
Mississippi		5	4
West South Central States			
Arkansas	2	2	1
Louisiana	4	5	6
Oklahoma	1	2	9
Texas	9	14	31
Mountain States			
Montana	3	4	1
Idaho		1	1
Wyoming	..	1	1
Colorado			2
New Mexico		1	
Arizona	1	1	1
Utah			..
Nevada		..	..
Pacific States			
Washington		1	3
Oregon	1	3	1
California	4	9	41
Territories and Possessions			
Alaska	..	..	..
Hawaii	2	2	
Puerto Rico	3	3	1
Total	149	314	256

Essay Contest on Chest Diseases.—The American College of Chest Physicians has announced the offering of three cash awards to winners of the 1959 prize essay contest: first prize, $500; second prize, $300; third prize, $200. Each winner will also receive a certificate. The contest is open to undergraduate medical students throughout the world. Essays may be written on any phase of the diagnosis and treatment of chest diseases (cardiovascular or pulmonary). The contest closes April 15, 1959. For application and information write the American College of Chest Physicians, 112 E. Chestnut St., Chicago 11.

Funds for Heart Research.—Completing a first decade of research support, the American Heart Association has announced that a total of about 8 million dollars, the largest sum the association and its affiliates have ever spent for cardiovascular research during a single 12-month period, will be expended for scientific studies during the 1958-59 fiscal year. Funds for this research come from public contributions to the annual Heart Fund appeal. Dr. Robert W. Wilkins, American Heart Association president, said that $3,063,604 represents awards made by the association's National Office. With its affiliates, the American Heart Association has expended about $31,500,000 for cardiovascular research since 1948, when it was reorganized as a national voluntary health agency.

Hospital Association Dedicates New Headquarters.—The American Hospital Association has dedicated its new headquarters building, currently under construction at the corner of Lake Shore Drive and Pearson Street, Chicago. Mr. Arthur S. Flemming, Secretary of Health, Education, and Welfare, was the principal speaker. The 12-story building is scheduled for completion in December. The American Hospital Association will occupy nine floors and the remaining three will house the American Association of Hospital Accountants, the American Association of Medical Record Librarians, the American College of Hospital Administrators, and the Illinois Hospital Association. The $7,851,900 building includes an auditorium and a series of conference rooms and classrooms. Four dining rooms, a cafeteria, and a kitchen are among the facilities. The association's headquarters have been located at 18 East Division Street since 1926.

Allergy Awards to Medical Students.—The Allergy Foundation of America has announced awards of $500 summer or quarterly scholarships to 22 medical students from medical schools throughout the United States and Canada "to encourage young students to broaden their knowledge in the field of the allergic diseases by research and clinical training." These awards were made possible by grants to the Allergy Foundation of American by the Gustavus & Louise Pfeiffer Research Foundation, Mr. John D. Rockefeller Jr., Mr. Peter Kuhn, and the Barker Welfare Foundation. The students selected were nominated by the deans of their respective medical schools in collaboration with the heads of basic science departments at these institutions. The Allergy Foundation of America, with headquarters at 801 Second Avenue, New York City, was established late in 1953, "not only to promote medical education and research in the field of allergic diseases, but to expand public education."

Recreation Congress in Atlantic City.—The 40th National Recreation Congress, sponsored by the American Recreation Society, the National Recreation Association, and the Public Recreation Association of New Jersey, will be held Sept. 22-26 at the Ambassador Hotel, Atlantic City, N. J. Speeches will be given by Dr. Howard A. Rusk, New York City, on "An Integral Part of Rehabilitation," and by Dr. Roland H. Spaulding, New York City, on "Motivation for the Patient, His Family and Friends." Nine special sessions on "The Ill and Handicapped" are scheduled, including "Recreation—A Positive Force in Preventive Medicine," with Dr. Alexander R. Martin, chairman, Committee on Cooperation with Leisure Time Agencies, American Psychiatric Association, Washington, D. C., as speaker. There will be workshops, demonstrations, and discussions covering special recreation program activities, use of volunteers, problems of supervision, etc. For information write Mr. Willard B. Stone, Secretary, National Recreation Congress, 8 W. Eighth St., New York 11.

Winners of Ophthalmology Fellowships.—Six physicians who are beginning their residency training in ophthalmology have been announced as the 1958 winners of fellowships provided by the Ophthalmology Scholarship Fund of the Guild of Prescription Opticians of America, Inc. Each fellow will receive $1,800, paid in monthly stipends over the three years of residency training. This year's fellowship recipients and the institution in which each will serve his residency are: Drs. Rolfe A. Becker, of Seattle, at the University of Minnesota, Minneapolis; Norman Sanders, of Miami Beach, Fla., at the Jackson Memorial Hospital, Miami; Ronald M. H. Pinkerton, of Montreal, at the Montreal General Hospital, Montreal; Clemens A. Struve, of Galveston, Texas, at the University of Texas Hospitals, Galveston; Blaine S. Boyden, of Hawaii, at the

Presbyterian Hospital, New York City; Edward F. Becker, of Lansdowne, Pa., at the Jefferson Medical College Hospital, Philadelphia. This brings to 17 the present number of recipients of guild fellowships.

Society News.—The officers elected at the annual meeting of the American Gastroenterological Association are: president, Dr. Clifford J. Barborka, Chicago; president-elect, Dr. H. Marvin Pollard, Ann Arbor, Mich.; vice-president, Dr. Hugh R. Butt, Rochester, Minn.; treasurer, Dr. George G. McHardy, New Orleans; secretary, Dr. Franz J. Ingelfinger, Boston; and members of the council, Drs. Julian M. Ruffin, Durham, N. C., Samuel A. Wilkinson Jr., Boston, and Charles A. Flood, New York City.—The officers of the National Medical Association, Inc., are as follows: Dr. Relliford S. Smith, Macon, Ga., president; Dr. Edward C. Mazique, Washington, D. C., president-elect; Dr. John W. Maxwell, Milwaukee, first vice-president; Dr. Paul T. Robinson Sr., Richmond, Calif., second vice-president; Dr. Horace L. Small, Denton, Md., third vice-president; Dr. John T. Givens, 1108 Church St., Norfolk, Va., executive secretary; Dr. Alfred C. Fentress, Norfolk, assistant executive secretary; and Dr. Eugene T. Taylor, St. Louis, treasurer. Detroit was selected as the place for the association meeting on Aug. 10-13, 1959, and the headquarters will be at the Sheraton-Cadillac Hotel.

Study of Pregnancy at High Altitudes.—A team of six doctors from five medical schools will go to the Peruvian Andes this fall for special studies of pregnancy at high altitudes. One objective of the expedition will be to study how human beings and animals have made necessary biological adjustments to a lack of oxygen. For several years the six doctors have collaborated on sea-level studies of pregnancy in animals. The expedition to Peru, financed by a grant from the Josiah Macy, Jr. Foundation, will be headed by Dr. Donald H. Barron, professor of physiology at the Yale University School of Medicine, New Haven, Conn., and will include Dr. William E. Huckabee, Boston University School of Medicine; Dr. James Metcalfe, Harvard Medical School, Boston; Dr. Harry Prystowsky, University of Florida Medical School, Gainesville; Dr. Andre E. Hellegers, Johns Hopkins University School of Medicine, Baltimore; and Dr. Giacoma Meschia, of Yale University. They will conduct their investigations at the Institute of Andean Biology in Morococha, 15,000 feet above sea level. Dr. Alberto Hurtado, director of the Institute and Dean of the Medical School of the National University of San Marcos, Peru, will be host to the visitors. The group will return to the United States in mid-November.

Meeting on Psychosomatic Medicine in New York City.—The fifth annual meeting of the Academy of Psychosomatic Medicine will be held Oct. 9-11 at the Park Sheraton Hotel, New York City. Dr. Bernard B. Raginsky, of Montreal, Canada, president of the academy, will open the meeting with an address. Nine luncheon panel discussions and the following three symposiums are arranged: "Mental Health and the General Physician," "Depression and Psychophysiologic Disease (An Attempt at Interdisciplinary Integration)," and "Psychopharmacology." A session on psychotherapy the afternoon of Oct. 11 will include the following:

Communication and Psychotherapy, Dr. Theodore Rothman, Los Angeles.

Minor Psychotherapy, Dr. Rudolf Dreikurs, Chicago.

Potentialities for Training in Psychiatry for the General Physician, Dr. Charles E. Goshen, Washington, D. C.

A movie session and technical and scientific exhibits are scheduled. At the academy banquet ($10) 8:30 p. m., Oct. 10, an award of merit will be presented to Dr. Wilfred Dorfman, Brooklyn, secretary of the academy. Fee for nonmembers is $5 (residents, interns, and nurses, $2). For information write Dr. Bertram B. Moss, Suite 1035, 55 E. Washington St., Chicago 2.

Report on Cancer Mortality.—Cancer mortality among industrial policyholders of the Metropolitan Life Insurance Company has shown notable changes over the last 15 years, the death rate from this cause decreasing 15% for females and increasing 8% for males, the company's statisticians report, based on a comparison of the cancer death rates among white industrial policyholders in 1936-1940 and 1951-1955. As a consequence of the contrasting trends for men and women, the death rate from cancer among males exceeded that among females by 20% in 1951-55, whereas 15 years earlier there was almost no difference. The report noted a large reduction (27%) in mortality from cancer of the reproductive organs among females. The adverse cancer mortality trend among males reportedly is due mainly to the large increase in the recorded death rate from respiratory cancer. This increase was about 140% in the period under study, the death rate rising from 9.8 per 100,000 in 1936-40 to 23.6 in 1951-55. During this period these malignancies increased from one-ninth to one-fourth of the total cancer death rate among males in this insurance experience. The respiratory cancer death rate for males now is more than eight times that for females. Other malignancies showing considerable increases as a cause of death among both males and females were leukemia and Hodgkin's disease.

Midwest Physicians Meet in Milwaukee.—The Midwest regional meeting of the American College of Physicians will be held Sept. 27 at the William L. Coffey Memorial Auditorium of the Milwaukee County Hospital, Milwaukee, Wis. The midwest region comprises Illinois, Indiana, Iowa, Minnesota, and Wisconsin. The scientific program will include the following papers to be read by invited guest authors:

Studies on Gamma Globulin Deposition in the Human Kidney in Health and Disease, Drs. Philip Freedman, John H. Peters, and Robert M. Kark, Chicago.

Serum Isocitric Dehydrogenase Activity with Particular Reference to Liver Disease, Drs. Richard L. Sterkel, Sidney K. Wolfson Jr., and H. G. Williams-Ashman, Ph.D., Chicago.

Plasma Optical Density as a Screening Test for Malabsorption, Drs. Arthur W. Horsley, James A. Clifton, III, and William E. Connor, Iowa City.

Experiences with Disseminated Lupus Erythematosis in Twenty-Eight Hospitalized Patients Over a Five-Year Period, Drs. Robert E. Johnston, Paul J. Fouts, and Richard W. Dyke, Indianapolis.

Bone Marrow Findings in Hurler's Syndrome, Drs. Louis F. Jermain, Robert J. Rohn, and William H. Bond, Indianapolis.

Systematic Manifestations Associated with Keratoconjunctivitis Sicca and Sjögren's Syndrome, Including a Study of Hematologic and Protein Abnormalities, Drs. Cynthia A. Stoltze, David G. Hanlon, Gertrude L. Pease, and John W. Henderson, Rochester, Minn.

Pathophysiologic Changes in the Adult Fanconi Syndrome, Drs. Robert E. Dedmon, Jay H. West, and Theodore B. Schwartz, Chicago.

Effects of Estrogen on Circulating Thyroid Hormone, Drs. Norman H. Engbring and William W. Engstrom, Milwaukee.

Presiding officers are Drs. Wesley M. Spink, Minneapolis; Wright R. Adams, Chicago; Willis M. Fowler, Iowa City; and Kenneth G. Kohlstaedt, Indianapolis. The meeting will be opened by Dr. Frederick W. Madison of Wisconsin. At the evening session Dr. Francis D. Murphy will be toastmaster and Dr. Howard P. Lewis, president-elect, American College of Physicians, will be the speaker. For information write Dr. Mark W. Garry, Veterans Administration Hospital, Wood, Wis.

LATIN AMERICA

Medical-Surgical Seminar in Dominican Republic.—A scientific seminar covering all aspects of medicine and surgery will be held at Ciudad Trujillo, Dominican Republic, Nov. 12-14. Under the auspices of the Asociación Médica Dominicana (Dominican Medical Association). Those who may desire to attend and those who may desire to present papers should communicate with the Honorary Consul of the Dominican Republic, Dr. Charles L. Rubenstein, c/o Polyclinic Hospital, 1055 Pine St., San Francisco 9, Calif. The Dominican Republic public health officials and the Dominican Medical Association are arranging the scientific and social programs.

EXAMINATIONS AND LICENSURE

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: The American medical qualification examination to be given henceforth twice a year for foreign medical graduates. Medical Schools in the United States and Foreign Countries, Sept. 23. Final date for filing application was June 23. Dates for the 1959 examinations have been set for Feb. 17 and Sept. 22. Executive Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Illinois.

BOARDS OF MEDICAL EXAMINERS

ALASKA:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

CALIFORNIA: *Written Examination.* Sacramento, Oct. 20-23. *Oral Examination.* San Francisco, November 15. *Oral and Clinical Examination for Foreign Medical School Graduates.* San Francisco, June 15; Los Angeles, August 17; San Francisco, November 16. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

COLORADO: *Endorsement.* Denver, Oct. 14. *Written.* Denver, Dec. 9-10. Exec. Sec., Mrs. Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

GUAM: *Subject to Call.* Act. Sec., Dr. F. L. Conklin, Agana.

MAINE: *Examination and Reciprocity.* Portland, Nov. 12-14. Sec., Dr. Adam P. Leighton, 142 High St., Portland.

MONTANA: *Examination and Reciprocity.* Helena, Oct. 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

NEW MEXICO:* *Examination and Reciprocity.* Santa Fe, Nov. 17-18. Sec., Dr. R. C. Derbyshire, 227 East Palace Ave., Santa Fe.

OHIO: *Examination.* Columbus, Dec. 16-18. *Endorsement.* Columbus, August 18; October 6 and Dec. 16-18. Sec., Dr. H. M. Platter, Wyandotte Bldg., Columbus 15.

SOUTH CAROLINA: *Endorsement.* Columbia, Dec. 9. Sec., Dr. H. E. Jervey, Jr., Blanding Bldg., Columbia.

TEXAS:* *Examination and Reciprocity.* Fort Worth, Dec. 4-6. Sec., Dr. M. H. Crabb, 1714 Medical Arts Building, Fort Worth 2.

WYOMING: *Examination and Reciprocity.* Cheyenne, Oct. 6. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: *Examination.* Juneau, Nov. 4. Sec., Dr. R. Harrison Leer, Room 204, Alaska Office Bldg., Juneau.

ARKANSAS: *Examination.* Little Rock, Oct. 6-7. Sec., Dr. S. C. Dellinger, Zoology Department, University of Arkansas, Fayetteville.

DISTRICT OF COLUMBIA: *Reciprocity. Examination.* Washington, Nov. 13-14. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave., N. W., Washington 6.

KANSAS: *Examination and Reciprocity.* Kansas City, Nov. 24-25. Sec., Dr. L. C. Heckert, Pittsburg.

MICHIGAN: *Examination.* Ann Arbor and Detroit, Oct. 10-11. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., W. Michigan Ave., Lansing 15.

TEXAS: *Examination.* Oct. 13-14. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WISCONSIN: *Examination.* Milwaukee, Dec. 6. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

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*Basic Science Certificate required.

GOVERNMENT SERVICES

ATOMIC ENERGY COMMISSION

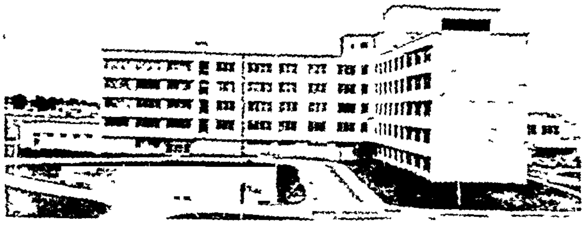
AEC to Lease or Sell Heavy Water.—The U. S. Atomic Energy Commission has established a policy to lease or sell heavy water for use in domestic or foreign research, medical or testing reactors. The requestor will have a choice of leasing the material at 4% per annum of the sales price or of purchasing heavy water at the established price of $28 per pound. Heavy water will be leased in quantities of one short ton or more for the initial inventory requirement of the reactor.

For domestic research or medical reactors, the term of the lease will be for the period for which the reactor is licensed; for foreign research, medical or testing reactors, the term of lease will be for the period of the estimated useful life of the reactor. Heavy water for domestic testing reactors will be leased for five years, subject to renewal for the duration of the period for which special nuclear material is also leased. All transfers of heavy water abroad, either by lease or sale, will be subject to appropriate safeguards.

Information regarding domestic lease of heavy water can be obtained from the U. S. Atomic Energy Commission, Savannah River Operations Office, P. O. Box A, Aiken, S. C. Persons interested in foreign lease of heavy water should contact the U. S. Atomic Energy Commission, Division of International Affairs, Washington 25, D. C.

AIR FORCE

New Air Force Hospital in Illinois.—The new U. S. Air Force Hospital at Scott Air Force Base, Illinois, completed in June, 1958, is a five-story, reinforced concrete, air-conditioned, 250-bed facility. This hospital will be a tuberculosis and thoracic surgical center for the Air Force medical service. Its other services include general medicine and surgery, orthopedics, ophthalmology, otolaryngology, pediatrics, obstetrics and gynecology, neurology and psychiatry, radiology, urology, and aviation medicine. Col. C. B. Stilson, M.C., is the Commandant.



Air Force Hospital, Scott Air Force Base.

ARMY

Army Medical Service Formulary.—The Army Medical Service Formulary (Technical Manual 8-245), the first publication of its kind in the history of military medicine, was released in August for worldwide distribution throughout the U. S. Army Medical Service. Compiled by Lieut. Col. William L. Austin, chief pharmacy consultant to the Army surgeon general, it will provide a convenient reference source of essential data on the Army's current therapeutic armamentarium and will foster uniformity in military medical therapeutics. It will be available on request through regular Adjutant General channels and will serve as the basic source of reference for clear, concise, and definitive information concerning drugs, both standard and nonstandard, available to military physicians for use in the treatment of disease. Part 1 contains general information relative to pharmacy management and prescription writing; part 2 contains a series of monographs on individual drugs, arranged according to therapeutic use or pharmacologic action; part 3 contains information on poisons and their suggested antidotes; and part 4 contains standard stock formulas for those preparations most frequently requested in Army pharmacies.

NAVY

Symposium on Space Medicine.—The Fourth Naval District announces the Ninth Annual Military Medico-Dental Symposium on Space Medicine for all armed forces of the United States, to be held Oct. 22-24 at the U. S. Naval Hospital, Pattison Avenue, Philadelphia, to which physicians, dentists, nurses, students, interns, residents, and hospital administrators are cordially invited. Retirement point credits will be awarded for those in attendance, including Army, Air Force, and Naval Reserve officers. There will be a symposium on human factors in extra atmospheric flight; a symposium on the management of head and neck injuries; a session on psychiatry; a session on medicine; and an evening session on Friday for medical students, interns, and residents, at which the chairman will be Rear Adm. J. R. Fulton, District Medical Officer, and the moderator, Dr. Elmer Hess, past-president of the American Medical Association and chairman of the National Advisory Committee for the selection of physicians, dentists, and allied scientists for the armed forces. Many other distinguished speakers will discuss such subjects as lipids, stress and atherosclerosis, biochemical aspects, pathological aspects, endocrine aspects, clinical studies with lipid mobilizer hormone, and there will be an address by the Assistant Secretary of Defense for Health and Welfare, The Hon. Frank Berry, M.D.

DEATHS

Adams, Granville Quinn Ⓜ Houston, Texas; born in Pocomoke, Md., Aug. 4, 1907; Johns Hopkins University School of Medicine, Baltimore, 1933; served on the faculty of Baylor University College of Medicine; fellow of the American College of Surgeons; specialist certified by the American Board of Surgery; an organizer of the Houston Surgical Society, of which he was secretary, vice-president, and president; associated with the Hermann, Methodist, Jefferson Davis, and St. Luke's Episcopal hospitals; consultant at San Jacinto Memorial Hospital in Baytown and the Texas Children's Hospital; died in the Hermann Hospital July 29, aged 50.

Alexander, Monroe Layfelte Ⓜ Canutillo, Texas (licensed in Texas under the Act of 1907); died in El Paso July 16, aged 82.

Allen, Greer A. Ⓜ Springfield, Ohio; Meharry Medical College, Nashville, Tenn., 1921; on the staff of the Springfield City Hospital; died in the Clark County Tuberculosis Sanatorium July 24, aged 64.

Appleton, Thomas J. Jr., Los Angeles; College of Physicians and Surgeons of San Francisco, 1906; died May 11, aged 72, of emphysema and cor pulmonale.

Asbury, Charles Lowery, Timmonsville, S. C.; Meharry Medical College, Nashville, Tenn., 1914; died in the Duke Hospital, Durham, N. C., June 21, aged 68, of carcinoma of the bladder, postoperative hypertension and arteriosclerosis.

Backman, Peter Louis Ⓜ Jerome, Pa.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1926; member of the board of directors of Conemaugh Valley Memorial Hospital in Johnstown; died in the Mercy Hospital, Pittsburgh, July 26, aged 56, of rupture of abdominal aortic aneurysm.

Baker, Roscoe Edward, Brookfield, Mo.; St. Louis University School of Medicine, 1927; veteran of World War II; died in the Veterans Administration Hospital, St. Louis, June 28, aged 56.

Barnes, Walter Steele Ⓜ Chicago; University of Buffalo School of Medicine, 1892; veteran of World War I; served on the faculty of Northwestern University Medical School; fellow of the American College of Surgeons; on the staff of the Mercy Hospital, where he died Aug. 2, aged 89, of cerebral thrombosis and arteriosclerosis.

Barnett, John Lacy Ⓜ San Antonio, Texas; University of Texas School of Medicine, Galveston, 1923; fellow of the American College of Surgeons; veteran of World War II; associated with Baptist Memorial Hospital, Santa Rosa Hospital, and the Nix Memorial Hospital, where he died July 27, aged 58, of embolism.

Bell, Richard Parker Jr. Ⓜ Lakewood, Ohio; born in Cleveland Jan. 24, 1920; Western Reserve University School of Medicine, Cleveland, 1945; veteran of World War II; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology and the Association for Research in Ophthalmology; fellow of the American College of Surgeons; served on the faculty of his alma mater; associated with the Community Hospital in Berea, Lakewood (Ohio) Hospital, and the University Hospitals, where he died in the Hanna House, July 26, aged 38, of glioblastoma multiforme of the left temporal lobe.

Birenboim, Irvin Myron Ⓜ Kansas City, Mo.; born in Kansas City April 25, 1920; Washington University School of Medicine, St. Louis, 1944; assistant clinical professor of otorhinolaryngology at the University of Kansas School of Medicine in Kansas City, Kan.; formerly on the faculty of his alma mater; specialist certified by the American Board of Otolaryngology; at one time secretary of the Jackson County Medical Society; member of the American Academy of Ophthalmology and Otolaryngology; veteran of World War II; formerly secretary of the Washington University School of Medicine Alumni Association; associated with University of Kansas Medical Center in Kansas City, Kan.; Kansas City General Hospital, Research Hospital, and the Menorah Hospital Medical Center; died July 24, aged 38, of a malignant granuloma.

Bolander, Lewis Paul Ⓜ Van Nuys, Calif.; College of Medical Evangelists, Loma Linda and Los Angeles, 1927; past-president of the San Fernando Valley Branch of the Los Angeles County Medical Association; found dead July 26, aged 58.

Boyd, Lee Jackson, Houston, Texas; (licensed in Texas under the Act of 1907); died April 22, aged 84, of acute cerebrovascular accident.

Cahoon, Daniel H. Ⓜ Roswell, N. M.; University of Chicago, The School of Medicine, 1941; served on the faculty of the Southwestern Medical School of the University of Texas in Dallas, where he was associated with the Parkland Memorial and Wood-

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Ⓜ Indicates Member of the American Medical Association.

lawn hospitals; on the staffs of the Eastern New Mexico Medical Center and St. Mary's hospitals; veteran of World War II; served in the regular Army; transferred to the U. S. Air Force in 1949, resigning in 1951; died July 25, aged 45, of acute myocardial infarction.

Ferrier, Paul Alexander Ⓜ Pasadena, Calif.; born in Liberty, Neb., Dec. 14, 1884; University of Pennsylvania School of Medicine, Philadelphia, 1911; specialist certified by the American Board of Urology; formerly on the faculty of the University of Southern California School of Medicine in Los Angeles; member of the American Urological Association; fellow of the American College of Surgeons; formerly on the staff of the Mayo Foundation in Rochester, Minn.; on the staffs of the Collis P. and Howard Huntington Memorial Hospital and St. Luke Hospital in Pasadena and the Los Angeles County General Hospital; died in Braewood Sanitarium in South Pasadena, July 10, aged 73, of bronchopneumonia and generalized arteriosclerosis.

Gellert, Edmund Ⓜ Kerhonkson, N. Y.; Regia Universita degli Studi di Bologna, Facolta di Medicina e Chirurgia, Italy, 1936; member of the American Trudeau Society; associated with Kingston (N. Y.) Hospital and the Veterans Memorial Hospital in Ellenville, where he died June 27, aged 47, of acute pulmonary edema secondary to chronic congestive heart failure.

Harris, Stephen Howat Ⓜ Oakland, Calif., Cornell University Medical College, New York City, 1935; specialist certified by the American Board of Urology; interned at Rhode Island Hospital in Providence; formerly a resident at the New England Deaconess Hospital in Boston, San Francisco Hospital, and Franklin Hospital in San Francisco; veteran of World War II; chief of urology the Veterans Administration Hospital, where he was found dead in the washroom July 15, aged 49, of poison, self-administered.

Jackson, Chevalier, Schwenksville, Pa., recipient of the 1940 Distinguished Service Medal of the American Medical Association, died in the Temple University Hospital, Philadelphia, Aug. 16, aged 92, of lobar pneumonia. Dr. Jackson was born in Pittsburgh Nov. 4, 1865. After studying at Western University of Pennsylvania, now the University of Pittsburgh, he went to Philadelphia, where he received his degree of doctor of medicine from Jefferson Medical College in 1886. He became professor of laryngology at the University of Pittsburgh School of Medicine from 1912 to 1916, when he accepted a similar appointment at Jefferson Medical College. In 1915 the New York Post-Graduate Medical School and Hospital elected him professor of bronchoscopy. He resigned in 1917 in order to curtail his work necessitated by the recrudescence of tuberculosis, his third attack. In 1924 he became professor of bronchoscopy and esophagoscopy at Jefferson. He held a similar position at the University of Pennsylvania Graduate School of Medicine from the time the department was created in 1919 to 1930, when he resigned. At this time he also relinquished a similar professorship in the University of Pennsylvania undergraduate school and his association with Jefferson, retaining at the latter, the title of permanent William Potter Memorial lecturer. He was president emeritus and emeritus professor of bronchoesophagology at the Woman's Medical College of Pennsylvania, where in 1934 he was named professor of bronchoscopy and esophagoscopy, in charge of a new bronchoscopic clinic. He was honorary professor of laryngology and bronchoesophagology at Temple University School of Medicine, where in 1930 he was elected professor of bronchoscopy and esophagoscopy, resigning in 1938 when he retired from practice. For a number of years prior to his death he was visiting professor of bronchoscopy and esophagoscopy at the Louisiana State University Medical Center in New Orleans. He taught abroad, and a ward in Children's Hospital, Paris, bears his name as a testimonial for his work there. The Chevalier Jackson Bronchoscopic Clinic at the Pennsylvania Graduate School is one of a number throughout the world that carries his name. In 1909-1910 he was chairman of the Section on Laryngology and Otology of the American Medical Association. He organized a committee on lye legislation to which is largely credited subsequent legal protection in the sale and labeling of lye and caustics. In 1925 he was awarded the American Medical Association's certificate of merit for an exhibit of bronchoscopic work, in 1927 received the Silver Medal for an exhibit showing household accidents to children and their prevention, in 1931 received special mention, and in 1932 received a certificate of merit for an exhibit on tumors of the lungs. Dr. Jackson was president of the American Laryngological Rhinological and Otological Society in 1911, the American Bronchoscopic Society in 1917, the American Laryngological Association in 1926, Pan-American Medical Association in 1934, and the American Therapeutic Society in 1937. He was a specialist certified by the American Board of Otolaryngology. During his professional life time, he was awarded the Bigelow, de Roaldes and Cresson medals, the Strittmatter award, and the gold medal of the Radiological Society of North America. In 1924 he received the Kiwanis medal for perfecting the bronchoscope. He was decorated by France, Belgium, Italy, and Brazil. In 1927 he received the Bok award from the city of Philadelphia, given to the resident who in the preceding year "performed or brought to its culmination an act or contributed a service calculated to advance the best interests of the community." Among his greatest contributions were the perfecting of the esophagoscope and the bronchoscope whose development stemmed from a wooden instrument that he devised while a child for a worker in the Pennsylvania oil fields to recover a bit lost at the bottom of a well. He is credited with saving the lives of many persons suffering from foreign objects in their lungs. His writings include twelve books devoted to his specialty and many contributions to systems of medicine and surgery. He published his autobiography in 1938. He was particularly interested in art. Dr. Jackson was known throughout the world as one of the greatest of leaders in the field of otolaryngology.

Joseph, Major Henry, Philadelphia; Medico-Chirurgical College of Philadelphia, 1912; an associate member of the American Medical Association; died in the Philadelphia General Hospital June 28, aged 68, of cerebral thrombosis.

Juster, Vincent de Paul Ⓜ Jamaica, N. Y.; St. Louis University School of Medicine, 1926; served on the faculty of New York Medical College, Flower and Fifth Avenue Hospitals in New York City; fellow of the American College of Surgeons; past-president of the Medical Society of Queens County; veteran of World War I; chairman of the medical board of the City Employees Retirement System in the Bureau of Retirement and Pensions; on the staffs of the Queens General Hospital and Mary Immaculate Hospital, where he was president of the medical board, and where he died July 31, aged 65.

Keating, William Patrick-Stuart, Willimantic, Conn.; Jefferson Medical College of Philadelphia, 1899; served in the Mexican border campaign and in World War I; formerly city health officer; at one time resident surgeon at the Fitch's Home for Soldiers in Noroton Heights; died in the State of Connecticut Veterans' Home and Hospital in Rocky Hill July 20, aged 84, of bilateral lobar pneumonia.

Kendrick, Charles Mattox Ⓜ Lenoir, N. C.; Duke University School of Medicine, Durham, 1933; veteran of World War II; interned at Wheeling (W. Va.) Hospital; served a residency at the Medical College of Virginia, Hospital Division, in Richmond, and the Valdese (N. C.) General Hospital; served on the staff of the Caldwell Memorial Hospital, where he died July 31, aged 50, of cancer.

Kleinman, Samuel Bernard Ⓜ Miami Beach, Fla.; Rush Medical College, Chicago, 1938; interned at the Cook County Hospital in Chicago; veteran of World War II; died July 18, aged 44, of leukemia.

Konzelmann, John Bruce Hill, South Brigantine, N. J.; Temple University School of Medicine, Philadelphia, 1941; an associate member of the American Medical Association; member of the American Society of Clinical Pathologists; interned at the Atlantic City (N. J.) Hospital, where he served a residency; formerly a resident at the Jefferson Medical College Hospital in Philadelphia; died July 29, aged 44, of pneumonia and multiple sclerosis.

Lazarus, Joseph, Kew Gardens, N. Y.; Universität Köln (Cologne) Medizinische Fakultät, Köln, Prussia, Germany, 1920; member of the Medical Society of the State of New York; died in the Kew Gardens General Hospital July 20, aged 64, of coronary thrombosis with myocardial infarction.

Leblicq, Fernand Joseph, Sandusky, Ohio; Cleveland-Pulte Medical College, 1913; veteran of World War I; chief surgeon at the Soldiers' Home; died in the Providence Hospital July 17, aged 66.

Ludwig, David Boyd Ⓜ Pittsburgh; Jefferson Medical College of Philadelphia, 1911; specialist certified by the American Board of Obstetrics and Gynecology; member of the American Associatio of Obstetricians and Gynecologists; fellow of th American College of Surgeons; on the staffs of th Columbia (Pa.) Hospital and the Allegheny Gen eral Hospital; died while vacationing in Van Bure Point, N. Y., July 19, aged 75, of a heart attack.

MacNamee, William Hiram, North Tarrytow N. Y.; University of the City of New York Medic Department, New York City, 1893; died in th Phelps Memorial Hospital July 22, aged 93, of lob pneumonia and arteriosclerotic heart disease.

Maier, Henry Whitfield, Greenville, Texas; Sout ern Methodist University Medical Departme Dallas, 1915; member of the Texas Medical Associ tion; veteran of World War I; died July 17, ag 70, of injuries received in an automobile acciden

Mantell, Sol R., Brooklyn; University and Bellev Hospital Medical College, New York City, 19 member of the Medical Society of the State of New York; died June 28, aged 57, of acute myocardial infarction.

Martin, Thomas Morris Ⓜ St. Louis; St. Louis University School of Medicine, 1926; fellow of the American College of Surgeons; served as secretary of St. Louis Medical Society; on the faculty and for several years member of the athletic board at his alma mater; a member of the board of trustees of Blue Shield and a member of the corporate board of Blue Cross; member of the staffs at St. John's, St. Anthony's, St. Mary's, and Barnard Free Skin and Cancer hospitals; surgeon for the St. Louis Police Department; died July 27, aged 55, of acute coronary occlusion.

Mathes, Sydney Bernard Ⓜ St. Louis; Washington University School of Medicine, St. Louis, 1947; from 1951 to 1953 an officer in the U. S. Army; specialist certified by the American Board of Internal Medicine; interned at the Barnes Hospital served a residency at the Salt Lake City General

Hospital in Salt Lake City, Utah and Jewish Hospital; formerly on the staff of New Biloxi Hospital in Biloxi, Miss.; died June 1, aged 34, of cerebral aneurysm.

May, James Robert Ⓜ Belmont, Ohio; Western Reserve University School of Medicine, Cleveland, 1936; for many years health commissioner of Belmont County; veteran of World War II; member of the American Trudeau Society; died July 22, aged 48.

Moore, Dan Miller, Oklahoma City, Okla.; University of West Tennessee College of Medicine and Surgery, Memphis, 1912; veteran of World War I; died in the Veterans Administration Hospital July 12, aged 69, of atherosclerotic heart disease.

Morris, Charles David, Louisville, Ky.; University of Louisville Medical Department, 1901; died in the Kentucky Baptist Hospital July 19, aged 80.

Mulford, Henry Jones, Buffalo; University of Buffalo School of Medicine, 1889; formerly on the faculty of his alma mater, and past-president of its alumni association; served on the staffs of the Children's Hospital, Crippled Children's Guild Hospital, Edward J. Meyer Memorial Hospital, and the Buffalo Eye and Ear Infirmary; died July 19, aged 91, of arteriosclerotic heart disease.

Neumann, Theodore William Ⓜ Central Valley, N. Y.; born in New York City Aug. 29, 1892; Medico-Chirurgical College of Philadelphia, 1914; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; physician in charge and owner of the Falkirk in the Rampos; consultant, Cornwall (N. Y.) Hospital and St. Luke's Hospital in Newburgh, at one time practiced in Poughkeepsie, where he was associated with the Hudson River State Hospital; past-president of the school board and the Central Valley National Bank; died July 27, aged 66.

Nichols, Dan O. Ⓜ Charlottesville, Va.; University of Virginia Department of Medicine, Charlottesville, 1926; member of the American Academy of General Practice; died July 24, aged 56.

Nienstedt, Elam J. Ⓜ Sikeston, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1913; served as president and secretary of the Southeast Missouri Medical Association; for many years president of the board of education of Blodgett; on the staff of the Missouri Delta Community Hospital; died June 29, aged 80, of heart disease.

O'Dell, Harry Clay Ⓜ Farmersburg, Ind.; Indiana University School of Medicine, Indianapolis, 1913; served overseas during World War I; associated with Union Hospital in Terre Haute; died July 19, aged 73.

Oppenheimer, Sali Ⓜ Oakland, Calif.; Universität Heidelberg Medizinische Fakultät, Baden, Germany, 1914; died June 5, aged 67, of arteriosclerotic heart disease.

Packard, Frederic Henry Ⓜ Marblehead, Mass.; Harvard Medical School, Boston, 1902; member of the American Psychiatric Association; for many years superintendent of the McLean Hospital in Waverley; died July 15, aged 83.

Palmer, Clayton Hall, Hartford, Mich.; College of Medical Evangelists, Loma Linda and Los Angeles, 1931; associated with Memorial Hospital in St. Joseph, where he died July 16, aged 63, of pyogenic meningitis.

Pitkin, Horace Collins Ⓜ San Francisco; Columbia University College of Physicians and Surgeons, New York City, 1924; died in St. Francis Memorial Hospital June 29, aged 60, of adenocarcinoma of the right lung.

Pomper, Irving, Brooklyn; Long Island College Hospital, Brooklyn, 1927; member of the Medical Society of the State of New York; veteran of World War II; served on the staff of the Kings County Hospital, where he died July 23, aged 55.

Rambo, William Harold Ⓜ Rolling Hills, Calif.; College of Medical Evangelists, Loma Linda and Los Angeles, 1926; member of the American Urological Association; fellow of the International College of Surgeons; served on the staff of the Hawthorne (Calif.) Community Hospital; died July 20, aged 58.

Reed, Elizabeth Bass Ⓜ Keene, N. H.; Woman's Medical College of Pennsylvania, Philadelphia, 1891; died June 19, aged 93, of bronchopneumonia.

Russell, Chester Ⓜ Artesia, N. M.; Barnes Medical College, St. Louis, 1898; past-president of the New Mexico Medical Society, Pecos Valley Medical Society, and the Eddy County Medical Society; associated with Artesia General Hospital, where he was a member of the board; served on the school board and city council; for many years local surgeon for the Atchison, Topeka and Santa Fe Railway; in 1954 was named "Practitioner of the Year" in New Mexico; died July 15, aged 85, of cerebral hemorrhage.

Schlesinger, Louis Hertz, Narberth, Pa.; Long Island College Hospital, Brooklyn, 1899; died June 4, aged 80, of heart failure.

Silvert, Michael, New York City; University and Bellevue Hospital Medical College, New York City, 1931; member of the Medical Society of the State of New York; veteran of World War II; killed himself May 2, aged 49.

Smith, Stephen Decatur Ⓜ Columbia, Mo.; Washington University School of Medicine, St. Louis, 1896; for many years head of the Missouri State

Committee for Education on Alcoholism; associated with the Boone County General Hospital; died July 19, aged 91, of cerebral accident.

Sonnenfeldt, Gertrud Ⓜ Sykesville, Md.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1923; member of the American Psychiatric Association; associated with Springfield State Hospital; died in Johns Hopkins Hospital, Baltimore, June 2, aged 62, of carcinoma of the breast.

Sproc, Charles Ⓜ Oak Park, Ill.; Chicago College of Medicine and Surgery, 1913; formerly practiced in Chicago, where he was on the staff of the Lutheran Deaconess Hospital; died July 24, aged 66, of acute coronary thrombosis.

Sturkie, Daniel R., North, S. C.; University of Georgia Medical Department, Augusta, 1900; served as a member of the state legislature, and as a trustee of the Medical College of South Carolina in Charleston; associated with the Orangeburg (S. C.) Regional Hospital; died July 19, aged 83, of coronary thrombosis.

Swank, L. Forrest Ⓜ Elkhart, Ind.; Indiana University School of Medicine, Indianapolis, 1921; veteran of World War I; died July 16, aged 60, of coronary occlusion.

Swern, Nathan Ⓜ Trenton, N. J.; Jefferson Medical College of Philadelphia, 1922; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; member of the American Academy of Allergy and the American College of Allergists; served on the faculty of his alma mater; consultant in medicine, Orthopaedic Hospital and Dispensary; associated with St. Francis Hospital, where since 1956 he was medical director; died July 27, aged 61.

Tronnes, Nils Laurantz, Fargo, N. D.; Kongelige Frederiks Universitet Medisinke Fakultet, Oslo, Norway, 1903; member of the North Dakota State Medical Association; fellow of the American College of Surgeons; received the Knight of St. Olaf medal from the King of Norway for his contributions to the honor of Norway, while serving as a physician in Fargo; one of the founders and on the staff of St. Luke's Hospital where he died July 21, aged 81.

Tucker, Winston Harris Ⓜ Evanston, Ill.; born in Calumet, Mich., June 5, 1901; The School of Medicine of the Division of the Biological Sciences, University of Chicago, 1934; specialist certified by the American Board of Preventive Medicine and Public Health and a member of its founders group; past-president of the Illinois Public Health Association and the Illinois Association of Public Health Officers; member of the American Trudeau Society; served as professorial lecturer on public health at his alma mater; formerly coordinating epidemiologist, state department of public health; since 1937 health officer of Evanston; held a degree of doctor of philosophy from the University of Chicago; well-known for his work on immunization against pertussis; died in the Evanston Hospital Aug. 3, aged 57.

Ware, Dudley B., Fitzgerald, Ga.; University of Georgia Medical Department, Augusta, 1898; on the staff of the Ben Hill County Hospital, where he died July 6, aged 83, of bronchopneumonia and cerebral hemorrhage.

Williston, Thomas Augustus, Washington, D. C.; Howard University College of Medicine, Washington, 1932; attending physician of the District of Columbia Health Department Tuberculosis Bureau for 18 years; on the staff of Freedmen's Hospital; died in the Trafalgar Hospital, New York City, July 26, aged 51, of cancer of the pancreas.

Witherspoon, Waldorf Henderson, Louisville, Ky.; Louisville National Medical College, Medical Department State University, 1905; died July 17, aged 79.

Worthing, Harry Jennings, West Brentwood, N. Y.; born in Norwood, April 14, 1888; Syracuse University College of Medicine, 1913; member of the Medical Society of the State of New York; life fellow of the American Psychiatric Association and past-president of the Suffolk County Branch; served as a member of the New York State Department of Mental Hygiene; veteran of World War I; formerly on the staffs of the St. Lawrence State Hospital in Ogdensburg, Harlem Valley Hospital in Wingdale, Potsdam (N. Y.) Hospital, and Southside Hospital in Bay Shore; at one time superintendent of the Willard (N. Y.) State Hospital; director of the Pilgrim State Hospital; a director and vice-president of the First National Bank of Bay Shore; died July 22, aged 70, of coronary thrombosis.

Wright, Frank Taylor Ⓜ Lincoln, Neb.; Lincoln Medical College, 1907; served on the staffs of the Arizona State Hospital in Phoenix, and the Lincoln State Hospital; died in Kansas City, Mo., July 21, aged 83, of coronary disease.

Young, Clifford William, Onawa, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1911; died in the Methodist Hospital Sioux City, June 27, aged 72, of coronary occlusion

Yu, Poe-Eng Ⓜ Middletown, Conn.; University of Michigan Medical School, Ann Arbor, 1939; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; veteran of World War II; associated with Connecticut State Hospital; died in the Massachusetts General Hospital, Boston, July 28 aged 59, of cancer.

FOREIGN LETTERS

BELGIUM

Asian Influenza.—At the meeting of the Society of Virology in March, E. De Mayer and co-workers reported their experience in the isolation of influenza virus of the Asian type. They concluded that the isolation of the virus is best accomplished when blood is taken within the first four days of the disease and that antibodies have already begun to decrease four weeks after the onset. Vaccination with an appropriate antigen gives protection. In an epidemic, those persons who have a predisposition to complications, such as those with cardiac or pulmonary disease, should be vaccinated.

Latent Urinary Tuberculosis.—Patients with latent urinary tuberculosis should be thoroughly examined, since failure to recognize this condition may lead to death. Auvery (*Acta urologica belgica*) observed 116 patients with isolated tuberculous bacilluria, in whom at the time of diagnosis no other lesion could be detected by roentgenography or by cystoscopy. A diligent search for Mycobacterium tuberculosis in the 24-hour urine was made in most of the patients, many of whom were not suspected of having tuberculous bacilluria; 19 patients were lost to follow-up. Regular investigations, consisting of urography, cystoscopy, urinalysis, and general examinations were carried out in the remaining 97. Of these, 34 continued to present simple bacilluria, although a diagnosis of urinary tuberculosis could not be proved. These patients were not given specific treatment. The bacilluria in most patients, did not last longer than six months.

The diagnosis of tuberculous bacilluria was probable in 15 patients who had tuberculosis in other locations, general signs of tuberculosis, and urinary symptoms. These patients were given specific treatment, which was without effect on the bacilluria. This latter did not generally last longer than six months. The diagnosis of tuberculous bacilluria was confirmed in 46 patients with the aid of guinea pigs inoculated with vesical or pyelic urine, obtained aseptically, roentgenographic or cystoscopic examination, persistent amicrobic pyuria, hematuria, and genital lesions in men. Urinary symptoms were always manifested within 18 months. Permanent cure of the symptoms was obtained by specific treatment in these patients, but it had no effect on the bacilluria, which in 75% of the patients lasted for more than six months. Its gradual regression with time was much slower than in the other two groups of patients. It was not observed in any patient after a lapse of five years. Some patients were given specific preventive treatment, which neither prevented nor retarded the appearance of the confirmatory signs. In two patients severe urinary tuberculosis developed and led to rapid destruction of the kidneys.

Meeting on Military Medicine.—The International Office of Documentation on Military Medicine held its 20th meeting in June in Liége and Brussels. It was one of the manifestations organized within the framework of the International Exposition in Brussels. An international training course in military medicine to give all future armed forces physicians of the whole world basically identical training was approved. The need for a standard program for the dissemination of the Geneva Conventions was stressed.

FINLAND

Serum Cholesterol.—Ancel Keys and co-workers (*Lancet* 2:175, 1958) investigated the serum cholesterol of people living in urban and rural districts of Finland, where the mortality and morbidity ascribed to cardiovascular and coronary disease is higher than in any other European country. In Finland coronary disease is common among manual workers, and its occupational distribution rather negates the general belief that coronary disease affects the professional and sedentary more than the manual worker. The total cholesterol and that in the α- and β-lipoprotein fractions were measured in 869 healthy men, aged 29 to 59, in Helsinki and in two rural regions. The total cholesterol levels tended to be higher than in other populations studied by the same methods by Keyes in Naples and Minneapolis, and this excess was accounted for by β-lipoprotein cholesterol, which was separated by paper electrophoresis. Farmers' wives resembled the men in the rural areas with respect to total cholesterol, but they had higher levels of α-lipoprotein cholesterol. In the age group 40 to 49, the men in occupations demanding heavy physical work had lower cholesterol levels than had the men in lighter work, but at other ages the cholesterol level appeared to be unrelated to habitual physical activity. Smokers tended to have higher cholesterol levels and lower blood pressures than nonsmokers. At all ages and at all levels of activity the men in east

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The items in these letters are contributed by regular correspondents in the various foreign countries.

Finland tended to have higher levels of total cholesterol in their serum than those in west Finland, and this difference was entirely accounted for by β-lipoprotein cholesterol.

Use of Skin in Arthroplasty.—In the Helsinki University two studies have been made concerning the usefulness of full-thickness skin as an interposition material in arthroplasties. Dr. Kettunen (Supplement 29 of *Acta ortopaedica scandinavica,* 1958) studied the fate of the skin so used in experimental animals and Dr. Erkki Kallio (Supplement 30 of same journal) conducted a clinical follow-up in human cases. In the animal-experiment operation the joint cartilage of the acetabulum was removed and a full-thickness skin graft was inserted into the acetabulum so that the epidermis faced the freshened articular surface. Controls were subjected to the same operation, but without interposition. The periods of observation were 7 to 240 days after the operation. The joints operated on were observed macroscopically and by roentgenography. The fate of the interposed skin material was studied histologically, histochemically, and historadiographically. The author concluded that the autogenous full-thickness skin graft with subcutaneous fat was eminently suitable as an interposition material. The epidermis of the skin was destroyed by the weight and function of the joint, and the connective tissue acting as interposition material underwent functional metaplastic development into cartilage. When no interposition material was used, articular weight and function tended to destroy the granulation tissue growing from the freshened articular surface so that in these joints the articular surface consisted of naked bone.

Dr. Kallio's material consisted of 171 patients with hip arthroplasty; 35 with vitallium cup, 83 with endoprosthesis, and 53 with skin arthroplasty. In 160 the indication for the operation was osteoarthritis, which in 84 patients was primary and in 76 secondary. The follow-up examinations of these patients were made from two to seven years after the operation. Independent of the method of operation used, 67% of the patients stated that they were either satisfied or pleased with the result. An affirmative reply to the question whether the new joint felt natural was given by 81% of those with skin arthroplasty, 60% of those with an endoprosthesis, and 44% of those with a vitallium cup. Work had been resumed on the average six months after operation. Absence or definite relief of the preoperative pain was reported by 62% of the skin arthroplasty group, 65% of the vitallium cup group, and 87% of the endoprosthesis group. About the same mobility value was found in the three groups at the follow-up examination regardless of the preoperative mobility of the joint. In patients in whom the hips before operation has been practically stiff, after operation they were as mobile as the hips which initially had better movement. In the latter patients the mobility had not notably increased. The movements of the hip when the patient began weight-bearing improved slightly in the course of one year but thereafter remained practically unchanged.

The least number of complications occurred in the patients with skin arthroplasty, in whom the incidence was 11.3%. There were no infections in this group. No new osteophyte formation was seen in the femoral head in these patients. It is possible that also in man the skin under favorable conditions may, due to function, develop into metaplastic cartilage. Clinical experience definitely indicates that full-thickness skin may safely be used as an interposition material and that there is every reason to develop arthroplasty further on this biological basis. The interposition material, however, is only one of many factors which influence the result of an arthroplasty. Because of its weight-bearing, the hip is disadvantageous for experimentation with new biological interposition materials.

Meprobamate in Psychiatry.—The effectiveness of meprobamate in the treatment of psychic disturbances was investigated by Dr. Arno Hormia (*Annales medicinae internae Fenniae,* vol. 47, 1958) in a series of 158 patients. Of them 30 were schizophrenic and the rest psychoneurotic. The dose of the drug was 400 to 800 mg. four times a day. The only side-effects observed were urticaria in two patients and restlessness and dizziness in one. In the schizophrenic group the effect of meprobamate was poor. In the psychoneurotic group on the other hand the results were good. Marked improvement or complete cure resulted in 66%. Acute and subacute cases benefited most. Of the psychoneurotics, those with anxiety and tension states responded best. In these meprobamate is the drug of choice.

Peroral Therapy for Diabetes.—Ikkala and Kaipainen (*Annales medicinae internae Fenniae,* vol. 47, 1958) gave carbutamide or tolbutamide to 147 diabetics. Another 33 patients started this therapy but had to discontinue it. Most of the patients selected were young, thin, and had taken insulin for several years, or used large quantities of insulin. Those who were predisposed to ketonuria were not included. Of the total, 27% were fresh cases, 43% had earlier been on dietary therapy alone, and 30% had earlier been on insulin therapy. Over half were followed up for over one year. A distinctly better sugar equilibrium was generally established in the fresh cases and in those who had earlier been on dietary therapy alone. Of another 459 patients on insulin, 61 switched to oral therapy. In 44 of these, insulin could be replaced by peroral treatment; in 9 (some of them did not meet the requirements for selection) peroral therapy was ineffective; and in 8 it was discontinued for other reasons. Insulin therapy was thus replaced by peroral therapy in 9.6% of this series. A weight gain, especially among diabetics who had earlier been on dietary therapy alone, was observed in spite of a warning to the patients that they should keep to their previously issued dietary instructions. Of the 33 patients for whom therapy had to be terminated, 6 were clearly outside the category for selection, therapy was considered unnecessary for 6, and was discontinued for 10 at the patients' request although no detrimental side-effects were noted. Therapy had to be terminated because of ineffectiveness in eight patients. Therapy was discontinued in three on account of allergic reactions.

FRANCE

Carcinogenesis.—At a meeting of the Academy of Science, Professor Champy stated that two years ago S. Hatem ascertained that organic carcinogens were fixed by histamine and that noncarcinogenic substances were not so fixed. It has now been shown that histamine also fixes carcinogens of mineral origin such as nickel. On the contrary, lead, which is not carcinogenic, is not fixed by histamine. These observations support the thesis of Coujard and Champy according to which an alteration of nerve fibers is an essential factor in carcinogenesis. The sympathetic nervous system is known to play a part in the growth of tissues and the regulation of this growth. Every injury to the nervous fibers due to histamine can interfere with the normal multiplication of cells and initiate a cancer.

Pulmonary Metastasis.—A. P. Naef (*Journal français de médecine et chirurgie thoraciques*, vol. 4, 1957) reported that pulmonary metastasis is seen more frequently than primary bronchial cancer and that 25% of all elderly persons with cancer have single isolated metastasis. The histological diagnosis is not always easy. A thoracotomy should be performed and the metastasis removed. The chances of prolonged survival are better if the metastasis is small, the interval between the primary operation and resection of the metastasis is long, and the primary tumor is growing slowly. In such patients with renal, uterine, or intestinal cancers, and a small metastasis discovered before lymphatic invasion allowing performance of a segmentectomy or lobectomy, five years of survival was observed in 27%.

The Premenstrual Syndrome.—J. Durlach (*Revue française de gynécologie et d'obstétrique*, January, 1958) gave 17 patients with premenstrual syndrome 3 to 16 250-mg. tablets of potassium nitrate daily from the date of expected premenstrual signs till the onset of menstruation. The drug acts as a diuretic. The results were good in 13 (9 recovered completely), fair in 2, and poor in 2. The same treatment was used in 13 pregnant women with the painful osteomuscular articular abdominopelvic syndrome described by Lacomme and Jamain and characterized by a decrease in blood potassium. For not more than 10 successive days the patients were given six 250-mg. tablets of potassium nitrate daily. The results were excellent in 10, fair in 1, and poor in 2. The patients tolerated this treatment well.

Postmaturation.—Toulouse and Dubois (*Revue française de gynécologie et d'obstétrique*, December, 1957) found in 4,120 deliveries 63 cases of postmaturation or 1.5%. These were all primiparas or pauciparas. Postmaturation recurred in three. The age of the patient did not appear to be related to the prolongation of pregnancy. Of 38 dystocic deliveries, forceps were used in 21 and a cesarean section was performed in 17. Signs of fetal suffering were observed in 17. The state of 45 of the infants on birth was satisfactory, 12 required resuscitation, and 6 were stillborn.

NORWAY

Anticoagulant Treatment.—Prof. P. A. Owren (*Tidsskrift for den norske laegeforening* [June 15] 1958) compared the results obtained with Quick's and his own methods for controlling the coagulation of the blood. He found the latter more accurate and less hampered by sources of error as well as possessing the practical advantage that it can be performed on samples of blood that are a day or two old. His patients were grouped according as they had rheumatic heart disease, myocardial infarction, or angina pectoris. Seventeen patients in the first group had been subject to recurrent thromboembolic episodes before treatment was started. Only one such episode occurred during treatment, whereas there had been 27 such episodes in an earlier corresponding observation period. There was no recurrent embolic episode among 15 patients receiving anticoagulant treatment for a total of 45 patient-years after their first attack, whereas in a control group of 17 patients observed for 55 patient-years, there were 20 recurrent major embolic episodes. The second group included 308 patients with myocardial infarction who had been under permanent anticoagulant treatment for 904 patient-years with an average mortality of 4.85% per year. This, Owren pointed out, was about half the mortality of the untreated controls. The third group included 471 patients with angina pectoris who had been under permanent anticoagulant treatment for 1,399 patient-years with an average mortality of 3.6% per year. This, again, was less than half the mortality in the control group.

Owren also quoted the observations of two Norwegians whose findings have supported his own. They were Bjerkelund, who studied survival rates in patients with myocardial infarction, and Waaler, who for several years kept a close watch over 275 of Owren's patients undergoing permanent anticoagulation treatment for angina pectoris. For lack of a corresponding Norwegian control material, Waaler used material from the Mayo Clinic and found treatment to be most effective when started early, the mortality from angina pectoris being reduced from 15 to less than 1% in its first year, whereas when it had already lasted several years little could be claimed for this treatment. The patients with angina whose symptoms had not lasted for more than two years derived the most benefit from anticoagulant treatment.

Nephritis in Childhood.—In 1945 Frisk and Klackenberg conducted a follow-up investigation of 214 children with acute glomerulonephritis in Sweden. Permanent renal damage was found in 5.6% after 10 years, and 4.7% had doubtful renal changes. As there had been a mortality of 2.3% in the acute phase of the disease, a complete cure could be claimed in only 87.4%. These findings may be compared with those of Steen and Rinvik (*Journal of the Oslo City Hospitals* [May] 1958) who have conducted a follow-up examination of 150 children with this disease. Few of the patients were severely ill on admission, and several presented neither hypertension nor edema. Complete rest in bed until the urine had become normal was ordered, and after discharge rest was recommended until macroscopic hematuria had ceased. Penicillin was injected daily in the first 10 days in hospital. At the follow-up examination all but three patients could be regarded as completely cured within two years of the onset of the disease. With regard to edema, hypertension, and hematuria, the authors found that the hematuria was the slowest to disappear. After six months nearly 30% of the patients still had slight hematuria. After one year this figure was reduced to 7%, and even after 18 months there were still 5% excreting an abnormal number of red blood cells in the urine.

Pyelonephritis.—Much of *Nordisk medicin* for June 26 was devoted to a discussion of chronic pyelonephritis. Professor E. M. Blegen admitted that for some unknown reason both chemicals and antibiotics have proved disappointing in this field, the more so because chronic pyelonephritis is so common and so likely to result in uremia. One contributor after another stressed his ignorance of the genesis of this ailment as well as his impotence to treat it successfully. Professor J. Böe said that antibiotics should not be given without identification of the causative organism. Many agreed that the tubercle bacilli should be looked for even when tuberculosis is not suspected. Catheterization may be injurious, particularly for women. Sulfonamides are still to be recommended, though their mode of action remain obscure.

American Surgeons Visit Oslo.—The visit in June of members of the American College of Surgeons to Oslo started with a welcoming ceremony in the Aula Hall of the University, where an orchestra, composed of doctors, supplied music suitable to the occasion. The visitors then broke up into groups, escorted by their Norwegian hosts, in order to witness demonstrations at various surgical centers. An airplane flight to the North of Norway enabled several of the visitors to verify for themselves the much-advertised charms of the midnight sun. The editors of the *Journal of the Oslo City Hospitals* celebrated the occasion by a special number beginning with an open letter of welcome to their American colleagues.

PORTUGAL

Poliomyelitis.—In Portugal poliomyelitis is not common. Every fall a few cases appear in the coastal region. Therefore the cost of an active immunization program would be out of proportion to the expected gain. As in many countries where there are but few cases, most of these are severe and the case fatality rate is high. For this reason vaccination, though not compulsory and not furnished free by the government, is strongly recommended.

Total Gastrectomy.—Prof Lima Basto (*Arq. pat.* 28:205-235 [Dec.] 1956) has used a technique for total gastrectomy that he devised on a series of 30 patients. In his hands the operation gives excellent results. He anastomoses the first loop of the jejunum to the esophagus to create a pouch over 10 cm. long. The afferent loop of the pouch is cut and an anastomosis to the efferent loop is made 8 cm. below the pouch. The technique is based on the fact that when a large longitudinal incision is made in the jejunum a spasm occurs. The pouch retains the food. The new stomach empties slowly, the spasm working as a new sphincter which opens regularly. There is no regurgitation of bile into the pouch and esophagus, and therefore esophagitis is never observed. The stimuli for pancreatic and biliary excretion are similar to normal, proving that prosecretin exists in the first segments of the jejunum, and the administration of hydrochloric acid with the food reproduces the physiological conditions of a normal stomach. The slow emptying of the new stomach prevents jejunitis, increases peristalsis which permits a better mixture of the food, and provides a better contact with the mucosal folds. The patients have no diarrhea. Some time after the operation the pouch takes the shape of a real stomach with an air chamber, the mucosal folds become broader and thicker, and the color changes to an orange yellow similar to that of the normal stomach. The patients, after a period of adaptation of one to three months, can take normal meals and are able to live a normal life. Tests show absorption to be generally normal. The deficiency in absorption of vitamin B_{12} and the absence of intrinsic factor are not resolved by this technique, but this is true of any other technique used.

UNITED KINGDOM

Arsine Poisoning.—In reporting three cases of arsine poisoning arising from cleaning sulfuric acid tanks, one of which proved fatal, A. T. Doig (*Lancet* 2:88, 1958) noted that arsine is one of the commonest causes of industrial toxic jaundice in peacetime, when trinitrotoluene is not being manufactured on a large scale. During the 12 years, 1945-1956, 13 cases, 4 of them fatal, came to the notice of the British Factory Department. The 13 cases occurred in seven incidents. The occupations of these 13 persons were tin smelters handling arsenical dross, 6; workers cleaning sulfuric acid tanks, 3; laboratory workers, 2; cleaning reaction in vessel which had contained arsenic acid, 1; and mixing oxalic acid and other chemicals in a vessel contaminated with As_2O_3,1. In the three cases reported by Doig, all the tanks had held acid made from pyrites, in two cases exclusively. In the third, a tank used for transporting acid by rail, fuming sulfuric acid had also been carried occasionally. It was recommended that, in so far as possible, acid tanks be cleaned without entry. When the deposit is soft, this can usually be done by repeatedly flushing with water and draining. When the deposit is hard, softening may be effected by strong alkalis or by steam. In discussing treatment, it is noted that dimercaprol has been used in most of the recently reported cases, but the results have been far from convincing, even when the dosage was adequate.

Expectation of Life Among Radiologists.—According to a report by the United States National Academy of Sciences, the average age at death of American radiologists is about five years less than that of their professional colleagues not continually exposed to radiation. Brown and Doll have studied the causes of death of 1,377 male British radiologists from 1897 to 1957 (*Brit. M. J.* 2:181, 1958). A comparison of the observed and expected numbers of deaths from all causes provided no evidence that occupational exposure to ionizing radiations caused a detectable nonspecific shortening of the expectation of life of radiologists. This observation is particularly striking since the numbers included most of the pioneer British radiologists, many of whom suffered from such effects of overexposure as radiation dermatitis and skin cancer. A significant excess of deaths from cancer occurred among those practicing radiology before 1921, the year in which the first committee met to devise methods of protection against ionizing radiations. These excess deaths were mainly due to tumors of the skin and pancreas and to leukemia.

No excess mortality from cancer was found in radiologists who entered their specialty after 1920, but it is too early to be certain that the hazard of cancer has been eliminated in those radiologists still alive. A small risk in a group of this size would not be easy to detect. A much larger number of persons are employed in industrial plants associated with the use of ionizing radiations that are more powerful and intense than those issuing from diagnostic x-ray machines. Some, for example, are exposed to fast neutrons, for which the relative biological efficiency for the induction of delayed radiation effects may be greater than that of gamma rays or medium voltage roentgen rays. The findings do, however, show that as long as care is taken to observe protective measures the long-term somatic risks of radiation are probably small.

Diabetic Coma in Infancy.—Diabetes is rarely seen under the age of one year. Beaven reported two infants under this age with diabetic coma. (*Brit. M. J.* 2:198, 1958). Both were admitted with rapid respiration, dehydration, and drowsiness, and in each a tentative diagnosis of pneumonia was made. As a result of increasing drowsiness and dehydration the blood sugar was determined. It was 400 mg. % in one and 1,000 mg. % in the other. The serum electrolytes showed a severe primary metabolic acidosis. Both infants recovered after treatment with 80 to 100 units of soluble insulin and a solution containing M/6 sodium lactate and isotonic saline solution given intravenously. After the blood sugar level fell, a 5% dextrose solution was given. One of the infants suffered from fits and twitching which were controlled by calcium gluconate. Because cases of infantile diabetes may masquerade as pneumonia or meningitis, the blood sugar should be estimated when these conditions are diagnosed and the infant shows signs of dehydration.

Russian Vaccine for Multiple Sclerosis.—Pressure from political quarters has been put on the medical profession to investigate claims made for a Russian vaccine for the treatment of multiple sclerosis. This vaccine, known as the vaccine of Shubladze and Margulis, was prepared in the Ivanovsky Institute of Virology, Moscow. Professor George Dick, of Queen's University, Belfast, who has examined the virus from which it was made and states that it is similar to rabies virus, has visited the Soviet Union for discussions with its originators. They confirm that it is antigenically indistinguishable from rabies virus and that it came from a strain isolated from the blood of a patient with a peculiar acute encephalomyelitic syndrome. There is no evidence that it is causally related to multiple sclerosis, or for that matter that any virus is. As far as the vaccine is concerned, no satisfactory trials have been made with it, either in U. S. S. R. or in other countries where it has been tested. Such a vaccine may actually be harmful and both Dick and Shubladze suggest that further investigations be made before any more patients are given the vaccine. It is unfortunate that it was made available before there was any reliable evidence of its clinical value and that discussions on it entered the political arena.

Medical Research Council's Report.—The Medical Research Council's 43rd Annual Report (*Report of the Medical Research Council for the year 1956-1957*, London, Her Majesty's Stationery Office, 1958) stated that great interest has been shown in the discovery of "interferon." One virus growing in tissue culture prevents other unrelated viruses from growing in the cells. This interference is due to a chemical substance, interferon, a product of the activity of the first virus and its cell host. It is a sort of viral antibiotic, and is thought to act by interfering with nucleic acid metabolism. It has been shown that a factor in the thymus predisposes mice to radiation-induced leukemia. Thymectomy on the other hand protects them. Studies on the mechanism of fever have shown that the pyrogens of bacteria, which are of lipopolysaccharide nature, probably do not act directly on the temperature regulating center of the brain but on the white blood cells, which liberate an agent exerting a thermostatic control. It sets the temperature at another level.

Surveys of rheumatic conditions showed that in Wales and Lancashire rheumatoid arthritis is equally common in both sexes and not, as generally supposed, more common in women. Much of the formerly diagnosed rheumatoid arthritis in women has turned out to be osteoarthritis. In men it seems that rheumatoid arthritis predisposes to pulmonary tuberculosis and pulmonary nodular fibrosis.

Wolfson Foundation.—The creation of a new charitable foundation with a capital of nearly 17 million dollars has been announced on behalf of Mr. Isaac Wolfson. This is the largest trust since the establishment of the Nuffield Foundation with a capital of 28 million dollars in 1943. The new foundation will have an income of $1,120,000 a year. As with all charitable trusts, this will be free of income tax. The purpose of the foundation will be to advance education and health in the United Kingdom and Commonwealth, with particular reference to scientific and technological education; build facilities for higher education; and foster youth activities, general medical research, cancer research, and medical, surgical, and nursing services. The foundation is also empowered to act in the United States and Israel. Within its chosen fields it will direct its effort where private donations can do most to initiate new projects.

Cause of Peptic Ulcer.—Possible etiological factors in 100 patients with peptic ulcer were investigated by Allibone and Flint (*Brit. M. J.* 2:179, 1958). These patients were hospitalized for massive duodenal hemorrhage or duodenal perforation. A matched series of patients who were admitted for another nonthoracic surgical emergency or accident served as controls. The incidence of acute respiratory infection and chronic bronchitis, uncomplicated by anoxia or heart failure, and the consumption of alcohol, aspirin, and other drugs was similar in the two groups, but the number of cigarette smokers among the men was significantly higher in those with ulcer than in the controls. It was concluded that there was no causal relationship between respiratory infection and gastric or duodenal hemorrhage, although such a relationship has been claimed by some. The relatively high incidence of chronic bronchitis in men both with and without peptic ulcer merely reflects the high prevalence of the disease in the industrial cities of England. Aspirin, although a gastric irritant, was rarely found to be a cause of hematemesis. This confirmed the authors' observation that even the large doses taken for suicidal purposes rarely cause massive hemorrhage.

Noise Abatement in Hospitals.—The annual report of the King Edward's Hospital Fund (*Brit. M. J.*, Aug. 2, 1958) stated that it is the unnecessary noises made within or near the hospital ward such as the squeaking wheel, the heavy footstep, and the slamming door that cause most distress. All the patients in Paddington Hospital over a period were asked to send to the fund a statement on the noises that bothered them most. The hospital manager was then asked to eradicate these noises insofar as possible. Over the course of several months he succeeded in doing this. Bed screens were stopped from rattling and banging; doors and litter wheels were oiled and repaired; student nurses were supplied with quiet, comfortable shoes; and dressing cart tops were covered with a sound-deadening material. These measures cured much of the noise, but the noisy patient and, worse, the snoring patient are still unsolved problems.

Hearing on National Health Service.—Mr. Walker-Smith, Minister of Health, announced in the House of Commons that surveys are being undertaken at various hospitals to promote greater efficiency and economy. He said there had been a striking change in the treatment of disease. About 98% of the people of Britain are registered with general practitioners Mr. Bevan (Labor) said that the National Health

Service has organized medical practice in such a way as to help those who need it most. On the therapeutic side there was general satisfaction with the service, but he was a little worried about mounting costs. He rejected the insurance principle as being wholly inapplicable to medical care, because you cannot give different types of treatment for different orders of contributions and you cannot perform a second-class operation on a patient if he has not paid up. Payments to the service are not insurance but tax. He said that there was no organic, financial, or administrative link between the National Insurance and the National Health Service. By assuming such a link, instead of increasing taxation to provide the additional money, the government had called for the money from the National Insurance fund. He believed this to be inimical to the scheme because it would appear to justify gradual transfer of the whole cost of national health to the shoulders of the poorest members of the community.

The cost of the service to the present government is a smaller percentage of the national income than it was in 1950. Mr. Bevan accused the treasury of nibbling away at the service. He believes there have been too many Ministers of Health and that they have not acquired sufficient stature in their office to oppose the treasury. He charged that hospital consultants, if they can get a paying patient into a hospital, jump the waiting list and get him in. This is a serious abuse. Hospital management committees should make a greater effort to assure that patients are admitted for medical reasons first, and that no one can buy his way in ahead of those who are more in need of hospitalization. Mr. Bevan asserted that if this was not stopped he would send the names of these consultants to the Minister of Health and see what happened.

Mr. Walker-Smith, speaking of the progress achieved over the last 10 years, said the number of effective beds was up by 6.5%, that of inpatients admitted by 29.5%, that of new outpatients treated by 12%, and that waiting lists were down by 11.5%. Deaths from tuberculosis had declined from nearly 22,000 in 1948 to under 5,000 in 1957. In 1940, 46,000 cases of diphtheria and nearly 2,500 deaths were reported, but last year only 37 cases and 6 deaths were reported. There had, however, been an increase in cancer of the lung, leukemia, and arteriosclerosis. An active program of poliomyelitis vaccination was carried out in 1958 and up to and including the 29th week of the year there had been fewer total cases and fewer paralytic cases than in the same period of any recent year. The problems of an aging population and of mental health demand increased attention. More than 40% of all hospital beds are being used for those suffering from mental disorder. A shift of emphasis to outpatient treatment is being sought. Only in this way can the health service meet the needs of patients without creating a crushing financial burden on the people. There has been an increase in capital expenditure on hospitals. A group of management consultants has offered to undertake a series of surveys at their own expense to demonstrate economies and improvements in efficiency which could be achieved in the hospital service. The minister accepted the offer.

Orf.—Human orf is due to a virus of the pox group, but is distinct from vaccinia or cowpox, and is a hazard of handling sheep. E. L. Gavin (*The Practitioner* 181:204, 1958) reported four cases which he saw this year due to the handling of pet lambs. In his area, County Carlow, Eire, orf has been unusually prevalent among lambs this year, possibly due to the exceptionally heavy rainfall. The four human cases, three in adults and one in a child, were all from different families. All three adults acquired the infection from feeding infected pet lambs, and the child, aged 2 years, had had close contact with an infected lamb. It is recommended that such cases be treated conservatively. Incision should be avoided. Penicillin or other antibiotics are ineffective except for secondary infection. Gavin, however, believes that painting with tincture of naphthyl methane disulfonate hastens resolution.

Poliomyelitis Vaccination.—Hitherto vaccination against poliomyelitis has been restricted to children under 15, expectant mothers, general practitioners, hospital and ambulance staff, and certain members of their families. The government hopes in the autumn to raise the vaccination age to 25 and to make a start with third injections of persons who have already had two. It is estimated that there are 6,250,000 people in the 15 to 24 age-group, and that those eligible up to March 31, 1959, for a third vaccination may total 6,500,000. The intention is that third injections should be offered not less than seven months after the second. American and Canadian vaccine is still providing the bulk of the supplies, and there is little evidence yet of more than a trickle of British-produced vaccine coming into use.

Peptic Ulcer and Tuberculosis.—Evidence of a higher than average, significant occurrence of peptic ulcer in tuberculosis was adduced by D. M. Kissen (*Health Bull. [Edinburgh]* 16:44, 1958). Among the 829 patients attending his tuberculosis follow-up clinics in 1956, he found 34 with peptic ulcer—an incidence of 4.1%. In 15 the peptic ulcer occurred before, and in the same number after, the onset of tuberculosis. In four, because of the proximity of the diagnosis or onset of symptoms with one another, it was not possible to say which occurred first. The finding of as many patients developing their ulcer after tuberculosis as before it, especially with such long intervals between—up to 11 years (average 7)—is not in keeping with the theory that the malnutrition of peptic ulcer is a main factor in the association of these two conditions, nor does the finding of more ulcer patients having had medical than surgical treatment—eight and seven, respectively, only four with partial gastrectomy—support the view that surgical treatment, especially partial gastrectomy, predisposes to the development of tuberculosis. The association between the two conditions can be better understood if it is appreciated that both have a psychological basis in their etiology. If there is a psychological association between pulmonary tuberculosis and peptic ulcer, then successful orthodox treatment of one affection may sooner or later be followed by the development of the other. It would appear therefore that successful orthodox treatment of the particular condition, be it tuberculosis or peptic ulcer, may be insufficient for the complete treatment of the patient. In other words, treatment by psychotherapy should also be given as an adjuvant to ordinary treatment with a view to possible prevention of the development of other psychosomatic conditions and the prevention of relapse.

Leukemia due to Irradiation.—A fatal case of acute granulocytic leukemia in a 10-month old infant, in which the cause may have been excessive x-rays of the mother during pregnancy, was reported by F. W. Gunz and co-workers (*Lancet* 1:190, 1958). The child was a fourth child, and was apparently normal when born after an uncomplicated labor, the birth weight being 4,422 Gm. (9 lb. 12 oz.). She developed much as her three siblings had and was well until six weeks before admission to hospital, when she began to bruise easily. She died on the 11th hospital day, and the diagnosis was confirmed at autopsy. The obstetric history was that the mother was obese (238 lb. [108 kg.]) and, because of doubt about the position of the fetus, she was x-rayed three times, with a total of five exposures of which three were anteroposterior and two were lateral projections. These were carried out on Nov. 15 and 28 and Dec. 7 (the day before delivery). Because of her obesity, the exposure times were longer than is usual, and no added filter was used for any of the exposures. It is estimated that the total dose to the fetus was 25.35 r.

General Practice.—The general practitioner in the National Health Service is the only self-employed man, professional or otherwise, in Great Britain who is forbidden to sell his goodwill, according to a memorandum entitled "Entry into General Practice" by the Fellowship for Freedom in Medicine (*The Practitioner* August, 1958). Even the dentist in the N. H. S. is allowed this freedom. This restriction on a self-employed person does not apply anywhere else in the world. Entry into general practice under the N. H. S. is controlled by executive councils supervised by a body known as the Medical Practices Committee.

There are now three main methods of establishment in general practice in the N. H. S.: (1) entry into partnership, after a period as assistant with a view to partnership, (2) appointment to an executive council vacancy, and (3) "squatting." All three methods have certain difficulties. In the case of the first, if prospects and conditions are good there are likely to be as many as a hundred applicants. There is no legal requirement that the principal must share his income with the assistant; hence the "view to partnership" has tended to become an illusion. In addition, there are difficulties in obtaining satisfactory terms in the partnership. Should the partnership be dissolved, the junior partner may suffer great hardship. He cannot sell his share of goodwill and buy a partnership in another district, as in former days, so that he may well be forced to accept most of the work for a small share of the income.

In the case of obtaining an appointment to a vacancy, the major difficulty is that these vacancies are scarce. In 1956 less than a third were advertised, and the average number of applicants was 43. Even when the appointment has been obtained, there is difficulty in finding practice premises as there is no obligation on, or incentive to, the retiring physician or widow to provide premises. There is no personal introduction and there is often long delay between the retirement or death of the previous physician and the appointment of the new one. "Squatting" or opening an office in competition with an established practice has always been risky but it is more so now that nearly all the population is registered under the N. H. S. and less than 2% o all general medical care is through private practice To overcome these difficulties the Fellowship pu forward a detailed scheme for the restoration of th purchase of goodwill.

Bone Meal and Anthrax.—Seven cases of anthra due to bone meal were reported from Scotland b Robert Lamb (*Lancet* 1:151, 1958). Four cases cutaneous anthrax occurred in a factory that pr duces animal charcoal for use in sugar refining. T factory imports bones from India, Pakistan, and t Argentine. The bones are crushed in the facto and the fine dust remaining at the crushing mills collected and sold as bone fertilizer. Frequent sa pling of the raw bones, the crushed bones, and t bone dust, which is found everywhere in the factory, even in the offices, has shown spores of virulent anthrax bacilli. In addition to the four cases of cutaneous anthrax, Lamb reported two cases of empyema from the same factory in which clostridia were isolated from the empyema fluid: Cl. tertium in one case and Cl. oedematiens in the other. As he was informed that in investigations of bone meal for anthrax, clostridial growth must be suppressed before inoculating guinea pigs, he suggested that such infection may be a further hazard of workers in this industry.

Green and Jamieson (*Lancet* 1:153, 1958) reported four cases of cutaneous anthrax, three of which occurred after the handling of bone fertilizers. The three were a farm laborer who had been handling a commercial fertilizer that probably contained bone meal; a farm manager who had been spraying fields with bone-meal fertilizer; and a boy, aged 15, who had been preparing soil for growing tomatoes which involved the use of bone-meal. The fourth was a veterinary surgeon who contracted the disease through contact with an infected animal. The bone-meal products were apparently Indian or Argentinian in origin. In an addendum a further case was reported in a seedsman, aged 17, and Bacillus anthracis was isolated from a sample of bone-meal handled by him.

Implantation of the Pituitary with Yttrium-90.—A new technique for the implantation of yttrium-90 in the pituitary was described by A. P. M. Forrest and co-workers (*Lancet* 1:192, 1958). This is said to ensure more accurate placement of the rods of yttrium-90. Using this method, 14 patients with metastatic mammary cancer, considered unfit for adrenalectomy, were treated by introducing twin screws, each loaded with 5 to 7 mc. of yttrium-90, into the pituitary. Three died from progression of the cancer within eight days of the implantation, and in all three the gland was entirely destroyed except for a single layer of subcapsular cells. In another patient who died six weeks after implantation, there was complete destruction of the pituitary.

Damages for Doctor's Widow.—Dr. Baker, of Ashby-de-la-Zouche, was stopped by the police between calls to patients and asked to help two men overcome by fumes from a gasoline-driven pump in a 50-foot well. He tied a rope around his waist and was lowered to the men, but as they were dead and he could no nothing for them, he signalled to be pulled up. The rope fouled on an obstruction and when Dr. Baker was rescued by firemen he was unconscious. He died from carbon monoxide poisoning on the way to hospital. His widow subsequently brought an action on behalf of herself and her two children against the employers of the men involved in the fatality, charging them with negligence in allowing the use of a gasoline-driven pump in a well without any safety measures or means of testing the air, and without warning employees of the danger. The employers were said also to owe a duty to those who, in common humanity, might go to the rescue in an attempt to save life. The judge gave judgment for Mrs. Baker for $33,720. He ignored the defense that Dr. Baker had voluntarily undertaken the risk of rescuing the men. It would be a slight on the legal profession, said the judge, to hold that such conduct on the part of a brave and humane physician could not reasonably be expected by those whose negligence created the peril which he sought to forestall.

Coronary Disease in Rural Areas.—In a random sample of 96 men, aged 55 to 64, drawn from a rural area in southwest Scotland and studied by Kennedy and Cowan (*Scot. Med. J.* 3:283, 1958) 43 were actively engaged in agriculture; 23 had evidence of coronary heart disease, and of these, 8 were agricultural workers. The authors concluded that in the rural area studied coronary heart disease is common. There appeared to be no difference between the smoking habits of the coronary and the noncoronary group. The average weight of the coronary group was 167.5 lb. (range 122 to 250 lb. [55 to 113 kg.]) compared with 155.6 lb. (range 115 to 232 lb. [52 to 105 kg.]) for the noncoronary group. Nine of the 23 subjects in the coronary group and 35 of the 73 subjects in the noncoronary group had a diastolic blood pressure of 100 mm. Hg or over. The mean blood pressure of the coronary group was 159.9/96.5 mm. Hg, and that of the noncoronary group 162.9/95.3 mm. Hg.

Splinter Hemorrhages.—Splinter hemorrhages have been recognized as a characteristic physical sign in patients with subacute bacterial endocarditis since they were first described by Lord Horder in 1920. Platts and Greaves examined the fingernails of 429 patients and normal persons and 35 cadavers in a search for splinter hemorrhages (*Brit. M. J.* 2:143, 1958). They found that these hemorrhages occur in many patients who are not suffering from bacterial endocarditis. Thus they occurred in 44% of patients with uninfected mitral stenosis, in 27% with rheumatic fever, and in 12 to 20% of those with arthritis, renal disease, blood disease, malignant neoplasms, heart disease (other than mitral stenosis), pulmonary disease, and peptic ulcer. No splinter hemorrhages were found in 35 normal subjects, although 12 acquaintances in normal health stated that they had them. Hemorrhages were found in 17.5% of all the subjects examined. Histological and histochemical examination suggested that they are due to emboli in the terminal vessels of the nail bed.

Tongue Biopsy.—Although tongue appearances and tongue prints have been used in the study of anemia, deficiency diseases, and subacute combined degeneration of the spinal cord, tongue biopsy does not seem to have been employed except for the investigation of such local lesions as cancer. Taft and co-workers described their experience with tongue biopsy, using a new suction biopsy tube that they designed (*Lancet* 2:69, 1958). At first fine scissors were used to cut fragments of tongue, but it was difficult to obtain sufficient depth and it produced subsequent pain. The suction biopsy tube is operated by applying a suction of 40 cm. Hg. A small fragment of tongue, anesthetized with 3% cocaine, is sucked into a hole and cut off. After removal the fragment is fixed in 10% formol in physiological saline solution and embedded in paraffin. The authors have made 50 successful biopsies in 40 persons with normal tongues or tongues showing atrophy or inflammation. The specimen was usually taken from an area about 2 cm. from the tip of the tongue and midway between the median groove and lateral edge. Three failures to obtain biopsy specimens were all in patients with marked epithelial atrophy, as in pernicious anemia and atrophic glossitis. No major discomfort was felt either during or after removal of the specimen.

Biopsy material from normal tongues showed the superficial squamous, prickle, and basal cell layers. Certain regions showed evidence of more rapid proliferation of the basal cells, these cells forming a layer three to six cells thick and being cuboidal or low columnar in shape, with darkly staining oval nuclei and scanty cytoplasm. More superficially the cells were prickle-cell in type, forming a layer about six cells thick. Here the cells were oval or spindle-shaped, with paler staining and irregularly shaped nuclei and peripheral intercellular bridges visible under high magnification. More superficially again there was a squamous cell layer, often containing keratohyaline granules. At the surface these cells formed filiform papillae whose surface was roughened by desquamating cells. When there was macroscopic atrophy of the tongue, good correlation was found with the histological appearances. With the development of atrophy the basal cell proliferation became slower and more even, producing a thin smooth epithelium. In a patient with pernicious anemia the administration of vitamin B_{12} was followed by a cellular response towards a more normal epithelium. The authors suggested that studies based on tongue biopsy may throw further light on the degenerative processes in various diseases, especially with regard to the cellular and tissue changes. Serial biopsy may also aid in assessing the value of treatment.

Cascara Poisoning.—Severe hypokalemia following illnesses associated with chronic diarrhea is well known. Aitchison recorded a case of severe hypokalemia developing in an elderly patient from abuse of cascara (*Lancet* 2:75, 1958). A preliminary diagnosis of coronary thrombosis was made in a man, aged 78, who was hospitalized because of sudden loss of power in his arms and left leg, but a routine electrocardiogram showed changes indicating hypokalemia, which was confirmed biochemically. The patient had been living for years on a diet consisting largely of bread, margarine, and tea, with little or no meat. He had the idea that he suffered from body odor and took six cascara tablets a day to correct this. As a result he had three bowel movements a day. This and his unbalanced diet produced hypokalemia, with a serum potassium of only 2.3 mEq. per liter. Recovery was rapid on a full diet and 1 Gm. of potassium chloride four times daily by mouth. The patient, however, could not be cured of his addiction to purgatives.

Hypophysectomy for Breast Cancer.—Hypophysectomy is an effective means of palliation in a significant proportion of patients with metastatic breas cancer. The technical difficulties of complete removal are formidable and a postoperative laboratory test would be useful to decide if this has bee complete. Bulbrook and co-workers correlated th excretion of estrogen with the preoperative an postoperative clinical state of patients sufferin from metastatic breast cancer and subjected to hypophysectomy (*Brit. M. J.* 2:15, 1958). They foun that patients in whom regression followed hypophysectomy tended to have a low preoperative leve of urinary estrogen and in most the estrogen excretion virtually ceased after operation. On th other hand continued estrogen excretion did not always exclude objective regression. Patients derivin no benefit from hypophysectomy tended to have high preoperative estrogen excretion and continue to excrete estrogen after operation.

Phenylethyldiguanide in Diabetes.—Bloom and co workers treated a series of 40 diabetics with phenylethyldiguanide (DBI) (*Brit. M. J.* 2:74, 1958) The diabetes was of all grades of severity. The patients' ages ranged from 18 to 78, and the 38 o them whose weights were normal were given 15 mg. of DBI 30 minutes before breakfast on the first day of treatment. On the second and subsequent days 50 mg. was given three times daily before meals. The full course lasted six weeks. The 24-hour urinary output of glucose was measured and the blood sugar levels were estimated daily at midday before lunch. In sensitive patients a hypoglycemic response occurred in 4 hours, was maximal in 6 hours, and was not measurable 10 hours after taking the drug. A significant fall of blood sugar level occurred in 26 of the patients. At a dosage of 50 mg. three times daily DBI reduced the blood sugar to normal levels, in some patients in the presence of ketonuria and in some who failed to respond to tolbutamide. Nausea, abdominal discomfort, vomiting, and diarrhea were severe enough in 25 to necessitate withdrawal of the drug. Symptoms quickly subsided on cessation of treatment. Only 6 of the original 40 patients were continued on DBI with satisfactory control. The fact that ketone bodies appeared with normoglycemia in some patients makes it likely that carbohydrate oxidation is not completely rectified even when the blood sugar has returned to normal. There was no increase in the postprandial fall of serum inorganic phosphorus, nor could any effect on the plasma amino-acid nitrogen be demonstrated. The authors concluded that DBI is unsuitable for general use in the treatment of diabetes because of the high incidence of unwanted side-effects.

Cancer Campaign Report.—The annual report of the British Empire Cancer Campaign stated that attempts to produce tumors in animals by painting the skin with carcinogens or administering orally the carcinogens from cigarette tar have not been rewarding. Experiments in which animals of several species have inhaled tobacco smoke for long periods have likewise not produced tumors. An extensive survey of patients treated in the past with estrogens showed that only 2 of 530 subsequently developed carcinoma, 1 of the uterus and 1 of the breast. Of 120 patients with carcinoma of the breast, only 5 were found to have been taking estrogens for more than a year at some time previously. It was found that estrogens continue to be excreted in the urine even when hypophysectomy or adrenalectomy is complete.

The increased use of exfoliative cytology in the diagnosis of cancer revealed that 3 to 4 women per 1,000 attending gynecologic clinics have a symptomless carcinoma of the cervix, usually in situ. By means of cytologic techniques, it was estimated that 2% of the women attending some clinics had a clinically undiagnosed pelvic cancer. Measurement of minute quantities of radiation, such as are emitted by the human body, particularly the skeleton, has been made possible by new techniques elaborated in the Campaign's laboratories. Even the fetus shows measurable radioactivity.

An American Looks at the National Health Service.—Professor P. F. Gemmill, of the University of Pennsylvania, reported in the *British Medical Journal* his impressions of the National Health Service. In reply to the question "Do you find the volume of paper work very burdensome?" only 39% of the 372 general practitioners he questioned replied in the affirmative. Some were pleased that they no longer had to send out bills for services rendered to private patients. The trend towards general-practitioner partnerships has helped to lessen the burden of paper work because the partnership can usually afford secretarial assistance, whereas the single-handed practitioner cannot. Patients sometimes make a nuisance of themselves because treatment is free. Of the physicians questioned 49% said that patients often consulted them for trivial reasons, 30% said that this happened occasionally, and 21% said that this occurred rarely. Some of the doctors, however, welcomed visits, even for apparently trivial reasons, because they argued that reassurance of the patient is part of the doctor's job, and 11% thought that serious ailments might be diagnosed in the early stages by patients seeking advice on what at first sight appeared to be a trivial condition.

The average number of patients per general practitioner in Professor Gemmill's survey was 2,283, but 53% of the doctors had less than this number and 47% had more. A few had the maximum permitted, or 3,500. About 59% said that they could cope with their list of patients, 38% found it difficult, and 3% reported that it was almost impossible to give adequate service. Visits by patients were rarely by appointment and as a result some of them might have to wait some time to see the doctor in his office. The waiting time in hospital outpatient departments varied greatly; 13% of the patients said that they usually had to wait more than two hours, 25% waited as long as this at times, and 62% hardly ever waited this long. Although there is a shortage of hospital beds, 73% of the general practitioners had no difficulty in getting patients hospitalized. The rest experienced difficulty unless the case was really urgent. The greatest difficulty was in finding beds for chronic invalids and the aged.

The gross remuneration of the general practitioner with an average number of patients was $6,874, and with the maximum number was $9,730. After allowing for the cost of running the practice, the net incomes before taxes would be about $4,584 and $6,488 respectively. It must be borne in mind that the cost of living is at least 25% higher in the United States than in Britain. In hospitals the basic salary for full-time specialists is $8,680 a year, but "distinction awards" may bring an additional $1,400 a year to 20%, $4,200 to 10%, and $7,000 to 4% of the total number of specialists. Incomes of general practitioners with the average number of patients were within the upper 2.4% of the nation's incomes. Those of doctors with the maximum number of patients were within the upper 1.4%, as were those of specialists of at least three years' standing.

Patients disliked (1) waiting in doctors' offices and hospital outpatient departments, (2) the small amount of time devoted to them by some doctors, (3) paying for dental and ophthalmic care, and (4) free medical care for foreigners. On the other hand they appreciated the fact that medical care is now a right and not a charity; that the best medical treatment is now available to those of low income; and that a severe illness would not ruin a patient financially. About 91% thought the health service satisfactory and 76% said that they had excellent care for serious illness. Physicians complained that practices could no longer be bought and sold; that they were unable to move freely from one area to another; that pay increases had not kept pace with the rise in the cost of living; and that private patients paid twice for everything. On the other hand they were pleased that they could prescribe the medicine they deemed best for the patient, regardless of expense; that they could visit the patient as often as necessary without the charge of fee-snatching; that their service was pensionable after 10 years; that they received fewer night calls owing to the increase of group practice and partnerships; and that they were spared sending out bills and trying to collect bad debts. About 92% thought that the national health service had come to stay.

Lung Cancer.—In the period March, 1955, to July, 1957, five young soldiers (aged 18, 19, 20, 21, and 23) in the Connaught Hospital (Army Chest Center) were found to have lung cancer. In view of the infrequency of the disease in this age group, Large and Morgan (*Brit. J. Tuberc.* 52:185, 1958) reported these cases in detail. Two were discovered by mass radiography. Initially, the patients complained of no symptoms, even when pressed to do so. Both had peripheral growths. Two others complained of productive cough and hemoptysis which could be attributed to the growths. Both had hilar and parahilar lesions. In the fifth patient, the presenting symptoms, headache and vomiting, were due to metastases. In one of the cases discovered by mass radiography the growth, which had originally been situated in the periphera of the apex of the lower lobe, grew so rapidly that, by the time the patient was bronchoscoped, it had replaced most of the left lung and had occluded the left main bronchus completely. In every case the growth was an anaplastic carcinoma composed of oat cells, small round cells, or both. It is admitted that in the two cases detected by mass radiography the final diagnosis was unnecessarily delayed by a too ready assumption that the lesions were tuberculous. One had a fairly well demarcated circular opacity which in an older man would have aroused suspicion and led to an earlier bronchoscopy. In the other the reporting of tuberculous granulations on pleural biopsy and a favorable response to antituberculous therapy led to a minimizing of the importance of the bloodstained aspiration fluid.

In spite of the comparatively early diagnosis in the series as a whole, only two patients were judged operable, and they survived operation (lobectomy in one and pneumonectomy in the other) by only six months. Two patients had deep x-ray therapy; one after a course of nitrogen mustard and the other as a postoperative measure. Of the three patients not operated on, one lived 17 days from the onset of his first symptom, one three months, and one five months.

Diets of Occupational Groups.—The annual report of the National Food Survey Committee for 1956 contains an analysis of household diets according to occupational groups. This shows that the consumption of most main foods declined steadily from class 1 (professional and technical occupations) to class 5 (unskilled occupations), the gradation being steepest for fresh fruit. For bread and potatoes, margarine and tea, the class gradient in consumption was reversed. Somewhat surprisingly reversed class gradients in consumption were als shown for bacon except for a peak in class 2, an for cakes except for a fall in class 5. Downwar class gradients in the consumption of several food were reversed in class 5 households who consume more meat, fish, eggs, butter, oatmeal, and preserv than households of class 4 workers. The values f class 1 were the highest, particularly for vitami A and C. This class also obtained 8 to 9% mo animal protein and riboflavin than the nation average, but slightly less iron, findings which r flect their higher consumption of fresh fruit, veg tables, milk, cheese, and meat and their low consumption of bread and flour. The intake class 2 equalled or slightly exceeded the nation average for all nutrients except vitamin A. Mine households were above average for all nutrien except vitamin A. Their large consumption of brea flour, and potatoes contributed to their high intake of iron, thiamine, and nicotinic acid. Agricultur workers' families obtained 14% less vitamin A an 10% less vitamin C than the average, mainly b cause of their relatively low consumption of live carrots, and fresh fruit, especially citrus fruit.

New Hypotensive Agent.—A preliminary clinic trial of a new hypotensive agent, Pempidin (1:2:2:6:6-pentamethylpiperidine) is reported b M. Harington and co-workers (*Lancet* 2:6, 1958 It is similar in many ways to mecamylamine, bein rapidly and completely absorbed from the intestin readily crossing cell membranes, excreted mo readily in acid than alkaline urine, and easily cros ing the blood-brain barrier. On the other han there are certain differences. Although 25% mecamylamine is bound to plasma protein, Pemp dine is not so bound, and therefore all the drug i the plasma is pharmacologically active. Furthe Pempidine is more rapidly excreted, which reduce the risk of toxic accumulation in the body. Continuous oral treatment was investigated in 27 patients, and it was concluded that a steady hypotensive effect could be maintained throughout the da when Pempidine was given orally at five-hour intervals. Because of the rapid elimination of th drug, the dosage could be quickly increased. Mos patients in whom treatment with Pempidine wa maintained experienced some side-effects, the symptoms being similar to those usually observed during treatment with ganglion-blocking agents. These side-effects ran parallel with the hypotensive action of the drug, coming on about 30 minutes after an oral dose, being at their maximum for one or two hours, and often wearing off before the next dose was due. All side-effects disappeared rapidly on omitting the drug.

CORRESPONDENCE

PENICILLIN REACTIONS

To the Editor:—In an article entitled "Follow-up Study of Fatal Penicillin Reactions" (*J. A. M. A.* 167:1118-1121 [June 28] 1958) it was stated that "one should not under any circumstances abandon the use of penicillin . . . despite a few tragic mishaps." These deaths are not, by my standard, few. The article mentions the investigations of 30 known deaths due to penicillin in New York City in a period of five years. How many more were unknown and not investigated, in New York City and throughout the nation, it is impossible to estimate, since, as the author admits, "it is obvious that one is hardpressed in making a survey of this type to get the crucial information because of the subsequent possibility of a legal problem." Further, the Lilly *Physician's Bulletin*, Feb. 15, 1958, stated: "It has been estimated that more than one thousand fatalities have occurred following the use of parenteral penicillin."

While the author advocates the continued use of penicillin, here are statements which, taken together, tend to disavow this advocacy: 1. "Instances of fatal reactions to penicillin are still occurring." 2. "There are reports of fatal and near-fatal reactions not only from orally administered penicillin but even from sucking a lozenge containing only 20,000 units." 3. "Even [skin or/and conjunctival testing] has its pitfalls, for . . . a physician . . ., in using the conjunctival test, had a near-fatal reaction in his office." 4. "It is hard to picture the busy general practitioner on his rounds of house calls, skin-testing every squirming youngster when in doubt." 5. "We have a choice of many new antibiotics, some of which have an unusually wide spectrum of applicability." 6. "There well may be in one out of seven people [a patient sensitive to penicillin or with a history of allergy]." 7. "Even the greatest care in inquiring about any previous use of penicillin and/or reactions thereto may fail to reveal unknown sensitization." 8. "There is no longer any doubt as to the ability of [penicillin] to cause fatal reactions." 9. There were only "12 [of 30 fatalities] in which the use of penicillin was [considered] indicated."

I must take special issue with the statement that "the patient has to shoulder some of the responsibility for these [deaths] because the patient often says to the physician, 'Just give me a shot of penicillin and I'll be O. K.'" Then the author immediately contradicts himself by properly stating that "the physician must be the sole and final judge as to what medication is needed," and, I say, the physician must therefore be solely responsible. While, as the author states, "penicillin is [admittedly] the least toxic . . . of all the antibiotics," this cannot be interpreted in favor of its continued use, since it is also the most allergenic. Thus, the profusion of penicillin reactions is emphasized by the author's own quotation of figures taken from a three-year nationwide survey by the Food and Drug Administration, involving 800 hospitals and over 1,600 physicians, that "of the reactions caused by 809 preparations . . . 793 were caused by penicillin with 72 deaths; and 16 reactions caused by streptomycin, dihydrostreptomycin, chloramphenicol, and tetracycline, with 2 deaths. . . . It has been estimated that the incidence of reactions [to penicillin] seems to be increasing by approximately 1% a year."

I long ago abandoned the use of penicillin except where proper studies indicated it to be the only antibiotic capable of affecting a given organism and in certain other limited specific indications. In doing so, and in using the safer broad spectrum antibiotics, I have witnessed no increase in morbidity, no prolongation of illness, no comparable toxicity, and no fatal reactions. Thus, my results have convinced me that this has been right for me and my patients.

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SURGERY FOR PARALYSIS AGITANS

To the Editor:—In his article in the July 5, 1958, issue of The Journal, page 1195, Dr. L. J. Doshay called attention to the revival of interest in the surgical management of paralysis agitans. Much of the vigor with which this problem is being attacked surgically stems from the rapid and far-reaching advances that have been made by Cooper, beginning with the anterior choroidal artery ligation and followed by chemopallidectomy and, most recently, chemothalamectomy. Developments by several neurosurgical investigators in the last year would justify modifying the statement concerning surgical attainments which appeared in The Journal that "Some favorable, though transient results, have been achieved in younger patients suffering from unilateral symptoms."

A symposium on basal ganglia surgery for involuntary movement disorders, sponsored by the American Rehabilitation Foundation and the Sister Elizabeth Kenney Foundation, was held at New York University in May, 1958. Neurosurgeons and neurologists, including Spiegel, Kjellberg, Sweet, Bertrand, and Reichert, reported on the growing number of stereotaxic instruments that are being used successfully for the increasingly accurate placement of lesions in a variety of basal ganglionic structures. At the same meeting, remarkable amelioration of tremor and rigidity was shown to be attainable through destruction of basal ganglia by means of chemicals (Cooper), electrical methods

(Wycis), and ultrasound (Meyers). The ideal candidates for operations would appear to be good operative risks with predominantly unilateral symptoms, but at the symposium over 100 *postoperative* patients were demonstrated by Cooper and Wycis, many of whom were elderly, had had bilateral involvement, and showed profound or complete relief of symptoms for periods up to five years.

An example of the increase in government and public interest in paralysis agitans alluded to by The Journal is the work of the Sister Elizabeth Kenney Foundation. This voluntary health agency has shown a continuous interest in the hyperkinetic disorders, having helped support the Cooper work for more than five years. This foundation is sponsoring a growing number of clinical and basic research projects in this field. These projects are designed to improve methods for placement and production of lesions and to delineate anatomically, physiologically, and pathologically those structures in the central nervous system that are responsible for both the production and relief of extraneous human movements.

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LAW DEPARTMENT

MEDICOLEGAL ABSTRACTS

False Affidavit as Basis for Commitment to Mental Hospital: Physician's Liability.—This was action for damages against the defendant physicians arising out of the detention of the plaintiff in a state mental hospital. From an adverse judgment, the plaintiff appealed to the Supreme Court of North Carolina.

In accordance with the statutes of North Carolina, the clerk of the Superior Court of Cleveland County appointed two of the defendant physicians to examine the plaintiff as to his mental condition. On the basis of such examination the plaintiff was sent to a state mental institution. The third defendant was the plaintiff's attending physician prior to his commitment. The plaintiff contended that the examining physicians did not give him more than a hurried, superficial, and totally inadequate examination and that he should not have been hospitalized on the basis of the certificates they executed. His suit was in the nature of a libel action.

The Supreme Court pointed out that these two physicians did not institute the proceeding, nor did they, or either of them, have anything whatsoever to do with the institution thereof. They were directed by the clerk of the court to perform an important duty. In discharging it, they were not engaged in the ordinary practice of their profession. Their role and function in examining plaintiff and signing the affidavits in respect to his mental condition were those of witness. Furthermore these examining physicians did not issue the order of commitment and detention; that too was done by the court clerk. The rule in this jurisdiction, continued the court, is that a defamatory statement made by a witness in the due course of a judicial proceeding, which is material to the inquiry, is absolutely privileged, and cannot be made the basis of an action for libel or slander, even though the testimony is given with express malice and knowledge of its falsity. Physicians, who are witnesses in judicial proceedings to commit an alleged mentally disordered person for confinement, have been accorded this absolute immunity from civil liability for their material and pertinent affidavits, certificates, and testimony. The judgment in favor of the examining physicians was therefore affirmed. *Bailey v. McGill*, 100 S.E.(2) 860 (N. C., 1957).

Workmen's Compensation Act as Bar to Action for Malpractice Against Physician.—This was an action for damages for injuries caused by the alleged malpractice of the defendant physicians. From a judgment in favor of the defendants, the plaintiff appealed to the Supreme Court of Washington.

The plaintiff, employed in an extrahazardous undertaking, experienced a pain in his side and went to the defendant physicians for examination. The defendants recommended an operation for the repair of a bilateral hernia, which they subsequently performed. During the course of this operation the defendants, either through negligence or because the plaintiff was mistaken in the operating room for another patient of the defendants, severed the plaintiff's vas deferens, that is, sterilized him. This action of the defendants was not reported to the department of labor and industries, so the plaintiff received no time loss or disability rating by reason of the severance of his spermatic ducts. He accordingly decided to sue the defendants for malpractice to recover for such injury. The defendants contended that the plaintiff was limited in his recovery to an application for an award under the Workmen's Compensation Act and that he could not sue the defendants directly.

The Supreme Court pointed out that the alleged sterilization operation had no connection with the industrial injury sustained by the plaintiff which resulted in the bilateral hernia. Furthermore the defendants were not co-employees with the plaintiff and bore none of the burdens imposed on an employer by the Workmen's Compensation Act. Accordingly the court concluded that there was no reason why the plaintiff could not sue the defendant physicians for their malpractice. Judgment for the defendants was reversed. *Shortridge v. Mede*, 319 P(2d) 277 (Washington, 1957).

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Tricuspid Stenosis: Clinical Features in Twelve Cases. T. Killip, III and D. S. Lukas. Am. J. Med. 24:836-852 (June) 1958 [New York].

The authors report observations on 12 patients with tricuspid stenosis. The histories of 5 patients are presented in detail to emphasize the variable manifestations of the lesion. The diagnosis of tricuspid stenosis was made clinically in 11 of the 12 patients on the basis of a characteristic murmur and thrill and was confirmed by cardiac catheterization. In 1 patient it was suspected on review of the catheterization data and was confirmed at postmortem examination. Eleven patients had rheumatic heart disease with multivalvular involvement; 1 had isolated tricuspid stenosis of uncertain etiology. Four patients underwent mitral valvuloplasty; 1 of these also had a tricuspid valvuloplasty. One patient had only a tricuspid valvuloplasty. Another patient died while being prepared for surgery, and autopsy was obtained. The diagnosis therefore was confirmed anatomically in 4 patients—by surgery in 2 patients and at autopsy in another 2. All but 1 of the patients were women. Five had a history of polyarthritis or chorea in childhood. In 9 murmurs had been detected prior to age 16. The ages of the patients ranged from 23 to 52 years.

The most striking clinical feature was a characteristic diastolic murmur with a thrill in the 3rd, 4th, and 5th intercostal spaces to the left of the sternum. The increase in intensity of the murmur during inspiration and the decrease during expiration aided in identifying the murmur and differentiating it from that of mitral stenosis. The intensity of the murmur varied with respiration in the same manner as the transvalvular diastolic pressure gradient. An opening snap of the tricuspid valve was heard in only 3 cases. Dyspnea, fatigue, and edema were the most common symptoms, but the resulting disability was quite variable. Recurrent ascites was present in 3 patients. The right atrium was enlarged in every patient but was massive in only 3. The largest right atria, the severest right atrial hypertension, and the greatest tendency to develop edema were associated with coexisting tricuspid insufficiency, multivalvular disease, and atrial fibrillation. Tall P waves, often taller than the QRS complex in lead V_1, and low QRS complexes with an rsr' pattern in lead V_1 were common features of the electrocardiogram. The pulmonary vascular pressures and resistance in patients with mitral and tricuspid stenosis were lower than in patients with a similar degree of mitral stenosis alone. Pulmonary venous hypertension, however, was not entirely prevented, and most of the patients had pulmonary congestive symptoms of mitral stenosis, including orthopnea. The failure of 1 patient to improve after mitral valvuloplasty was attributed to the tricuspid stenosis.

Torulosis (Cryptococcosis): Case with Involvement of Lungs, Central Nervous System and Probably Veins. J. Pelaez and J. S. Cuadrado. Rev. clín. españ. 69:97-102 (April 30) 1958 (In Spanish) [Madrid].

Torulosis involves by preference either or both lungs and the central nervous system and may involve other organs. No case of torulosis with primary localization in the veins has hitherto been reported. A patient was hospitalized for treatment of painful migratory phlebothrombosis of the legs of 6 months' duration. The veins of the legs were painful on palpation and felt like hard cords. Anticoagulant, antibiotic, and antispasmodic drugs relieved the pain. On the second day of hospitalization the patient complained of an acute headache. He became stuporous. Examination of the fundus of the eye showed bilateral papillary stasis. There was neither cough nor sputum. Roentgenologic examination of the thorax showed a tumor in each lung. An electroencephalogram showed abnormalities suggestive of cerebral metastases. A second roentgenogram of the thorax, taken 5 weeks after the first, showed rapid growth of the pulmonary tumors. Late in the course of the disease the patient developed a sputum, in which, as well as in cultures from the sediment of the cerebrospinal fluid, Torula histolytica was identified. The patient grew rapidly worse and died 2½ months after hospitalization. The authors believe that in this case torulosis was located primarily in the superficial veins of the legs

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The place of publication of the periodicals appears in brackets preceding each abstract.

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and was transferred to the lungs through the blood and to the central nervous system through the concurrence of some unknown factor.

The Changes in Concentration of Cholesterol in the Serum of Hypertensive Patients During Antihypertensive Therapy. Q. B. Deming, M. E. Hodes, A. Baltazar and others. Am. J. Med. 24:882-892 (June) 1958 [New York].

The concentrations of total cholesterol in the serums of hypertensive patients have been reported to decrease during the administration of the Kempner rice diet, hydralazine, or pentolinium. The present communication presents data concerning the changes in serum cholesterol concentration and in blood pressure occurring in 21 hospitalized hypertensive patients during treatment with reserpine, hydralazine, reserpine plus hydralazine, chlorisodamine, or mecamylamine. There were 38 treatment periods. The data obtained confirm earlier reports that serum cholesterol concentrations decrease during therapy with hydralazine or with ganglionic blockade. They do not demonstrate a similar decrease during administration of reserpine. A parallelism was apparent, in some patients, between changes in blood pressure and changes in cholesterol concentration. The possibility that there may be a direct relationship between the 2 functions is suggested.

Observations on the Behavior of Various Diagnostic Aids in Myocardial Infarction. B. R. Durant, G. N. Bowers Jr. and P. H. Twaddle. Am. J. M. Sc. 235: 644-655 (June) 1958 [Philadelphia].

Twenty-five patients admitted to the Hartford (Conn.) Hospital with the clinical diagnosis of myocardial infarction were studied with serial determinations of serum glutamic oxaloacetic transaminase, serum glutamic pyruvate transaminase, lactic acid dehydrogenase, and C-reactive protein, as well as erythrocyte sedimentation rate, leukocyte count, and electrocardiograms. Twenty-two of the 25 patients were considered to have had a myocardial infarction. Six of the patients died, and in all the diagnosis was confirmed at autopsy.

It was found that the lactic acid dehydrogenase values run parallel to the serum glutamic oxaloacetic transaminase values and offer little additional aid in establishing the diagnosis of myocardial infarction. Lactic acid dehydrogenase remained elevated longer than the serum glutamic oxaloacetic transaminase in less than 50% of the cases. Abnormal serum glutamic pyruvate transaminase activity was noted in 50% of the cases. No consistent relationship of the serum glutamic pyruvate transaminase to the serum glutamic oxaloacetic transaminase was noted. When clinical shock complicated a myocardial infarction, regardless of its size, elevations of the serum glutamic pyruvate transaminase level invariably occurred. The causes for serum glutamic pyruvate transaminase elevations were undoubtedly multiple, but centrolobular necrosis of the liver was probably the most common. The C-reactive protein value proved to be an excellent, although nonspecific, indicator of myocardial necrosis. Where enzymatic studies are not available, it would appear to be superior to the erythrocyte sedimentation rate in following the course of an infarction. A battery of enzymatic and serologic studies in patients suspected of having sustained a myocardial infarction can be extremely helpful. The tissue origin of serum glutamic oxaloacetic transaminase elevations can be more clearly delineated by concurrent serum glutamic pyruvate transaminase determinations.

The Role of Salt in the Fall of Blood Pressure Accompanying Reduction in Obesity. L. K. Dahl, L. Silver and R. W. Christie. New England J. Med 258:1186-1192 (June 12) 1958 [Boston].

There is considerable evidence that the incidence of hypertension is significantly greater among obese adults than among nonobese persons. Numerous studies have been published indicating that when weight reduction is brought about in such patients a fall in the elevated blood pressure frequently follows. Some observers have expressed doubt that a decline in weight is responsible for a decline in the high blood pressure of obese subjects. One of the authors has been interested in the relation of sodium to the hypertensive process in human beings, not only in the mechanism by which sodium restriction produces its blood-pressure-lowering effect but also, more particularly, in the accumulated evidence that excess sodium ingestion is the primary etiological factor in the development of essential hypertension. It was postulated that not weight loss but curtailment in salt intake was the effective means of lowering blood pressure in an obesity-reduction program. The 12 ambulatory adult patients in this study were hospitalized on a metabolic ward of the Brookhaven National Laboratory Research Hospital, Upton, N. Y., throughout the investigations reported here. Eleven patients had "essential" hypertension, which had been present for 2 to 14 years. No patient had evidence of serious renal disease, and none had had heart failure or edema. All had negative phentolamine tests for pheochromocytoma. The patients were about 20 to 100% in excess of their ideal weight. The 12th subject was a grossly obese woman of 52 who weighed 179 kg. (394 lb.) during the control period, a weight more than 3 times her ideal. The diagnosis of essential hypertension in this patient is open to doubt in view of the problem of measuring the blood pressure in such a patient.

The authors aimed to make but a single change at a time in the regimen—that is, in calories or salt—so that the effects of changes could be separated clearly. Fall of blood pressure appeared to be closely correlated with curtailment of sodium chloride. There was some evidence that the obese hypertensive subject was more sensitive to salt restriction than the nonobese. It was suggested that the obese person, in eating more food, also ate more salt and hence had more hypertension; in obesity reduction, salt as well as calories ordinarily were reduced, and it was the salt restriction, not the caloric restriction, that was the effective agent in lowering blood pressure.

Role of Dietary Sodium in Essential Hypertension. L. K. Dahl. J. Am. Dietet. A. 34:585-590 (June) 1958 [Chicago].

The National Research Council gives the average salt intake for the normal adult as 7 to 15 Gm. per day (2.8 to 6.0 Gm. of sodium). The author shows that, while metabolic balance can be maintained on a few hundred milligrams of sodium daily, the average intake in our society commonly appears to exceed this by a factor of about 20. Individuals and societies have been found to thrive on salt intakes far below current levels; thus, it is unlikely that high-salt ingestion is based on need. It seems probable that the salt appetite of human beings is an induced one, based largely on social custom and habit, much as is the use of tobacco and alcoholic drinks. Evidence that sodium plays a primary role in the causation of essential hypertension in human beings is considerable and is based on (1) production of hypertension in animals by excess salt feeding, (2) relief of human hypertension, in some cases, by salt restriction, (3) low incidence of hypertension among racial groups and individuals on low-salt diets, and (4) high incidence of hypertension among groups and individuals on high-salt diets. In another paper the author had recommended that, for the individual without a family history of hypertension, a maximum intake of 5 Gm. of sodium chloride (2 Gm. of sodium) per day be eaten; for those with a family history of the disease, not more than 500 to 1,000 mg. of sodium chloride (200 to 400 mg. of sodium) per day should be allowed.

The Arterial Hypertension of Atherosclerosis. C. Lian. Presse méd. 66:933-935 (May 24) 1958 (In French) [Paris].

Clinical experience seems to show that the arterial hypertension of atherosclerosis is quite distinct from hypertensive disease properly so called. The increase in pressure in hypertensive disease affects both the systolic and the diastolic pressures, whereas in the hypertension of atherosclerosis only the systolic pressure is elevated and the diastolic remains normal. The functional disturbances found in these two distinct types of hypertension are similar, but their underlying physiopathological mechanism is quite different. Hypertensive disease properly so called (essential or renal hypertension or endocrine hypertension) is due to generalized arterial hypertonia. The hypertension of atherosclerosis, which affects only the systolic pressure, is due to the aortic sclerosis which interferes with the stretching of the aortic wall during ventricular systole, so that the lumen of the aorta is reduced and the dissipation of the intra-aortic systolic pressure is prevented.

The two conditions can easily be differentiated by determination of the systolic and the diastolic pressures and by taking into account the slight hypertension affecting only the systolic pressure that may appear in young subjects with hypersympatheticotonia and tachycardia. The prognosis in cases in which the systolic pressure is equally increased depends on whether there is an elevation in the diastolic pressure and, if so, to what degree. The hypertension of atherosclerosis is, therefore, less grave than that of hypertensive disease properly so called. Extracts of Rauwolfia serpentina have a beneficial effect on patients with hypertensive disease, but produce little or no change in the hypertension of atherosclerosis, which is usually irreversible. Arterial sclerosis, however, though it cannot be reversed, can be held in check by various antiatherosclerotic measures, and its ischemic consequences can be alleviated by raubasine (Hydrosarpan), one of the active principles of rauwolfia, and by certain vasodilating medicaments.

The Prognosis of Infective Hepatitis: A Preliminary Account of a Long-Term Follow-Up. E. R. Cullinan, R. C. King and J. S. Rivers. Brit. M. J. 1:1315-1317 (June 7) 1958 [London].

While it is generally agreed that the great majority of patients who suffer from acute infective hepatitis make a complete recovery with no lasting damage to the liver, the condition may relapse or recur. In a small proportion of patients serious destruction of liver parenchyma occurs, resulting in acute or subacute hepatic necrosis. Although the importance of uncomplicated infective hepatitis in the etiology of portal cirrhosis is not known, it must be considered as a possible long-term sequel to the acute attack. The medical records of a random sample of 1 in every 5 soldiers who had had infective hepatitis in the epidemic (July 1, 1942, to June 30, 1943) during World War II were screened. The sample numbered 1,465. From the total were deleted 78 men killed in action, 4 who died at the time of the acute attack, 6 who died of other causes, 60 who had had previous arsenical injections for the treatment of syphilis, and 24 who were untraceable. Of the 1,293 men contacted, 1,052 (81.4%) replied; 1,030 replies were satisfactory.

Some patients have had a recrudescence of symptoms while still in the hospital, one observer putting the figure at 15%. The figure in the present sample cannot be given, although 85 (8.3%) of the patients had a recurrence of infective hepatitis after leaving the hospital, at times varying from weeks to years. Approximately 26% of the sample felt 100% fit immediately upon leaving the hospital, 68% at the end of 1 month, 87% at the end of 3 months, and 95% at the end of 1 year. Seven years after the attack 33 (3.2%) of the patients stated that they had never felt 100% fit since the acute illness. A study of the hospital records revealed no instances of subacute necrosis progressing to portal cirrhosis. It seemed possible in 1949 that the 9 men who had complained of periodic slight jaundice ever since their acute attack might be suffering from longstanding mild subacute cirrhosis of the liver. This same group in 1957, with the exception of 1 man, stated that they now felt 100% fit, making it extremely unlikely that they had progressed to portal cirrhosis.

Carcinoma of the Pancreas: A Clinical Study Based on 84 Cases. D. Birnbaum and J. Kleeberg. Ann. Int. Med. 48:1171-1184 (June) 1958 [Lancaster, Pa.].

The authors analyze ethnic, clinical, laboratory, and pathological features in 84 patients with primary carcinoma of the pancreas whose cases were collected from 3 hospitals in Israel. The disease occurred mainly in Jews from European countries and rarely in those from Oriental or African countries. Anorexia, loss of weight, weakness, and pain were the most frequent symptoms. Psychological changes were present in 10 patients. Jaundice appeared chiefly in patients with malignancies in the head of the pancreas. Painless jaundice was rare. Only about half of the patients with jaundice had a distended gallbladder. In 15 of 62 patients roentgenologic examination of the gastrointestinal tract suggested a disorder of the pancreas by revealing displacement or deformities of neighboring organs.

Laboratory tests frequently showed an increase in the erythrocyte sedimentation rate. Hyperglycemia was found in nearly half of the patients; its incidence did not seem to be influenced by the location of the malignancy within the organ. The cholesterol level of the serum was found to be increased in about 75% of the patients examined. The alkaline phosphatase level of the serum was increased in the majority of patients with jaundice but in only 2 of those without jaundice. No correlation could be established between the cholesterol and alkaline phosphatase levels and the bilirubinemia. Examination of the feces demonstrated external pancreatic insufficiency in 38% of the patients examined. The importance of this simple test is emphasized. Serum amylase determinations proved to be of limited value. Thromboembolic signs complicated the course of the disease in 10 of 14 patients with carcinoma of the body or the tail of the pancreas and in 4 of 15 patients with carcinoma of the head of the pancreas. The role of trypsin in the thromboembolic process is discussed.

Massive Doses of Cortisone in Hepatic Coma. T. Pessar and J. W. Hessing. Ann. Int. Med. 48:1254-1268 (June) 1958 [Lancaster, Pa.].

Corticotropin or cortisone have been used in the treatment of hepatic diseases, but the results have been controversial. The authors report 6 patients, who were admitted to Queens General Hospital, Jamaica, N. Y., in hepatic coma, resulting from advanced portal cirrhosis, and who were treated with cortisone. Some of these patients relapsed into coma and were treated again. In all, 10 episodes of hepatic coma were treated. The regimen employed was as follows: the administration of 250 mg. of cortisone every 6 hours for from 1½ to 2 days; then 250 mg. every 12 hours for from 1 to 2 days; then 250 mg. daily for from 1 to 2 days. The drug was then withdrawn. In addition to cortisone, each patient received such supportive therapy as 5% dextrose solution by intravenous injection, electrolytes as needed, vitamins, blood (if bleeding), and antibiotics. All patients were given 3 to 6 Gm. of potassium chloride daily, either by mouth or intravenously; the exact amount depended on the serum potassium levels. With the exception of 1 patient who was inadequately treated, all came out of coma dramatically and quickly. In 2 instances relapses into coma responded promptly to the same therapy. All 6 patients showed evidence of advanced hepatic damage, and all eventually died of various complications of cirrhosis, including coma. It is felt that a continued trial of high doses of cortisone in hepatic coma is warranted.

Suppurative Lymphadenitis Due to B.C.G. (Study Based on 30,000 Vaccinated Subjects). R. Mande, C. Fillastre and A. Herrault. Rev. tuberc. 22:165-173 (Feb.-March) 1958 (In French) [Paris].

This study, which is based on findings obtained in 29,898 controlled subjects, mostly children, deals with the occurrence and frequency of suppurative lymphadenitis due to BCG. Suppurative lymphadenitis was observed in 96 patients (0.32%), but in children less than 2 years old the percentage was distinctly higher (1.24%). Lymphadenitis generally occurs only once; it has never been observed as a late recurrence at the site of a previous lymph-node suppuration. All the BCG strains studied up to the present time have caused suppurative lymphadenitis. The authors show that the dose of vaccine administered is more important than the manner of vaccination—a finding which has great practical significance. Undoubtedly many of the cases of lymphadenitis observed in vaccinated children, away from the specialized centers, were due to an excessive dose of vaccine and could, therefore, have been at least partially avoided.

A Review of Werner's Syndrome, with a Report of the Second Autopsied Case. J. K. Perloff and E. T. Phelps. Ann. Int. Med. 48:1205-1220 (June) 1958 [Lancaster, Pa.].

Werner, in 1904, described the syndrome of "cataract in connection with scleroderma." Thirty-six years earlier Rothmund had described cataracts in association with a peculiar degeneration of the skin among the consanguineous populations of 3 Bavarian villages. While some writers made no distinction between these 2 syndromes, others, particularly Thannhauser, distinguished the skin changes in Werner's syndrome from those of scleroderma, reemphasized the differences between Werner's and Rothmund's syndromes, and discussed 4 other distinct but apparently related disorders: cataracta dermatogenes, hereditary ectodermal dysplasia, dystrophia myotonica, and progeria of children with nanism (Hutchinson-Gilford syndrome). In this paper the authors report a classic case of Werner's syndrome which came to autopsy after several years of clinical observation. Except for a study published 15 years ago, there has been no autopsy study on a patient with this syndrome.

The patient, a man, was seen in August, 1953, at the age of 47 years. He was said to have been underweight and undersized since adolescence. Tight, dry skin, especially of the lower extremities, was noted at the age of 11 or 12 years, and callosities of the soles appeared in sequence. At the age of 30 the first of recurrent, indolent ulcers became manifest on the malleoli and achilles tendons. Three years later rapidly progressive bilateral cataracts appeared, and the following year, at the age of 34, loss of potentia coeundi occurred, with initial retention of libido. At the same time baldness began, with canities and a decrease in axillary, pubic, and facial hair. Thereafter the pitch of the voice became higher, and its strength diminished. About the latter part of his 4th decade the patient began to drink progressively larger amounts of alcohol to relieve the pain of the ulcers. He was admitted to the District of Columbia General Hospital, Washington, D. C., where the diagnosis of Werner's syndrome was established. Two years later he began a series of readmissions to that hospital for bilateral cataract extractions, bilateral lumbar sympathectomies, skin grafts at the site of indolent ulcerations, and finally, in 1953, a Smith-Bennett midleg amputation. There was, in addition, an admission in 1951 for right upper lobe pneumonia and melena, after which the patient stopped drinking. Because of the progressive disability, further care was arranged at the Washington Home for Incurables, from which subsequent admissions were made to Georgetown University Hospital.

Neither the autopsy study in this case nor that in the previous one explained the etiology of Werner's syndrome. The evidence obtained seems to exclude the endocrine glands as etiologically fundamental. Werner's syndrome apparently is a hereditary "abiotrophic" disorder which appears either as the isolated forme fruste or as a profound somatic disturbance of the complete disease state. The authors call attention to the relative frequency of neoplasia, particularly sarcoma, in Werner's syndrome.

Observations and Considerations of a Case of Idiopathic Hyperlipemia. P. Nazzaro and B. Rossi. Policlinico (sez. prat.) 65:723-731 (May 12) 1958 (In Italian) [Rome].

The authors report a woman, 50 years of age, with idiopathic hyperlipemia, characterized by high serum lipid level, milk-white serum, and optical density of the plasma. The patient complained of xanthomatous type of skin lesions for 4 years and of sporadic attacks of abdominal pain for 2 years before this study began. Somnolence and mental confusion appeared after meals.

The patient was placed on a restricted diet and treatment with phenylethylacetamide. The drug was given in daily doses of 3.2 Gm. for 7 weeks and of 2.4 Gm. for the following 8 weeks. The serum cholesterol level decreased from the initial value of 1,020 mg. per 100 cc. to the normal value after 5 weeks of medication; the value increased again after the daily dosage of phenylethylacetamide was reduced to 2.4 Gm. The optical density of the plasma similarly decreased to almost within the physiological limits between the 3rd and the 5th week of treatment; the value increased again after that. The drug therapy also caused decrease in body weight, improvement in the skin lesions, and correction of psychic disturbances. Administration of heparin contributed to the amelioration of the psychic state, which deteriorated again, although not as severely as before, 6 months after the discontinuance of therapy with phenylethylacetamide.

Early Results of Isoniazid Therapy in Relation to the Active Isoniazid Level in the Serum (A Study of 100 Cases). J. N. Vivien, R. Thibier, J. Grosset and A. Lepeuple. Rev. tuberc. 22:208-222 (Feb.-March) 1958 (In French) [Paris].

Isoniazid is transformed in the human organism into several derivatives which are almost all inactive against Mycobacterium tuberculosis. Measurement of its active fraction, which cannot be arrived at by the current methods of chemical assay, can be accurately made by methods of biological assay. The characteristics of the active isoniazid

12.6 degrees or 43%. There were 3 significant reasons for this regression. Inadequate immobilization from inefficient use of the brace (because the parents loosened the apparatus) was responsible for an early loss in specific instances. Some operations were inadequate because the exposure was not wide enough, the soft parts were not thoroughly removed, or the facets were not fused. Homogenous bone proved to be less salutary than autogenous bone in providing a solid fusion. Pseudarthroses occurred in 34 (39%) of the 87 patients; of these, 17 were repaired. The incidence of pseudarthrosis did not show significant variation with regard to sex. There were more failures of fusion in patients with idiopathic curves than in those with paralytic curves. A few of the best results were early ones when ambulation was permitted at 2 months. Later, patients who were kept in bed for 6 months without facet fusion had a higher percentage of pseudarthrosis than those in whom fusion was recently done, with destruction of the posterior articulations, but who had bed rest for only 4 or 5 months.

In the treatment of scoliosis, it is important to think of the posture, health, and function of the patient and not merely of straightening the shadows seen in the roentgenograms. One is constantly faced with the problem of when to operate. It is unwise to fuse unnecessarily when the patient is very young. It is also unwise to neglect the patient so long that disastrous, irreversible changes develop. There is no justification for withholding operation from a growing child because of fear of complications and changes that might occur with further growth. The Milwaukee brace relieves the surgeon of the chore of making a huge operative cast. It is more comfortable for the patient than the cast and lessens some of the objections to the operation. With the method of correction and fixation simplified, it would seem logical to operate earlier on the progressive curves and thus diminish the duration of treatment and the ultimate deformity for a greater number of children.

Compression in Arthrodesis: A Comparative Study of Methods of Fusion of the Knee in 93 Cases.

M. J. Stewart and W. G. Bland. J. Bone & Joint Surg. 40A:585-606 (June) 1958 [Boston].

Of 93 fusion operations of the knee joints which were performed at the Campbell Clinic in Memphis, Tenn., 63 were conventional arthrodeses, and 30 were performed with the aid of the compression method. Key's method of compression was used for the first 5 compression arthrodeses, and the Charnley clamp was adopted for the other 25 compression operations. The average time required for clinical and roentgenographic union in the patients subjected to compression arthrodesis was less than half as long as that in patients with conventional arthrodesis. Ambulation, too, was possible much earlier in patients with compression arthrodesis. In patients in whom fusion of the knee joint was necessitated by a condition involving difficulties, such as tuberculosis, union occurred in all 5 operated on by the compression technique, but it occurred in only 17 (75%) of the 22 patients subjected to conventional arthrodesis and required nearly twice as long. Only 4 patients with neurogenic arthropathy (Charcot's disease) were operated on, and union was slow in the 2 in whom the compression technique was used, while union did not occur in the other 2 who were subjected to conventional arthrodesis. In 12 patients with severe fractures involving the knee joint who were operated on by the compression technique, a longer time for union was required than the over-all average. This delay was probably caused by the amount of sclerosis which developed as a result of the trauma and impairment of the blood supply. Chapchal's method of intramedullary fixation across the knee joint has not been tried at the Campbell Clinic; however, the principles of this method are in accord with the contemporary concepts of the requirements for arthrodesis and fracture healing. In the 1 patient treated by the Henderson technique (parallel Knowles pins), the joint united promptly. When the compression apparatus is correctly used in arthrodesis of the knee, the patient is spared much morbidity, discomfort, and disability. It is evident that compression arthrodesis of the knee joint possesses many advantages over the conventional method of arthrodesis, both to the patient and to the surgeon.

A Follow-up Study of the Treatment of Scoliosis.

J. C. Risser and D. M. Norquist. J. Bone & Joint Surg. 40A:555-569 (June) 1958 [Boston].

The authors report follow-up studies on 242 patients with scoliosis who were operated on. Seventy-five of these had paralytic scoliosis resulting from poliomyelitis, and 167 had idiopathic scoliosis with much evidence pointing to metabolic deficiencies, and, therefore, the term "metabolic scoliosis" was coined for these. The group of patients with paralytic scoliosis was almost equally divided between male and female patients, but only 20% of the patients with metabolic scoliosis were males. The average postoperative period was 6 years, the longest being 20 years. The method of spine fusion used was the Hibbs subperiosteal dissection. Forcible correction of the scoliotic deformity is possible by the combination of parallel traction and lateral bending in the turnbuckle jacket with anteroposterior hinges or by the same forces with the addition of localized posterolateral pressure on the apex of the rib angulation in the localizer cast. A turnbuckle jacket was applied postoperatively to

177 patients and a localizer cast to 62. Since increase of the scoliotic deformity occurs with growth of the spine, prevention must begin with the mild curves before vertebral growth is completed. One hundred seventy-one patients had not completed their spinal growth when treatment was started; in this group only 2 patients were observed whose deformities at follow-up were worse than at the start of the treatment. Prevention of increasing deformity was not a problem in the remaining 71 patients in whom vertebral growth was complete at the start of the treatment.

Correction of the existing deformity and maintenance of this correction were problems in both groups. The amount of correction obtainable in patients with scoliosis depends on the flexibility of the spinal joints. Of 177 patients treated in the turnbuckle jacket, 127 (72%) obtained good to excellent results, with total correction (average recumbent correction and, in addition, forcible correction) of from 10 to more than 20 degrees maintained. Forty-eight (77%) of the 62 patients treated in the localizer cast obtained good to excellent results. Poor selection of the fusion area, with the result that the fusion was either too long or too short, was the first cause to explain the postoperative loss of the initial correction. Moderate or severe loss of this type (33%) was observed in patients treated in the turnbuckle jacket but not in those treated in the localizer cast. The second cause for a loss of correction was an inefficient cast which did not hold the correction after spine fusion. This "holding loss" was greater in the patients treated in the turnbuckle jacket than in those treated in the localizer cast. The third cause of loss of correction was pseudarthrosis; the greatest losses of correction occurred in its presence. The incidence of pseudarthrosis was greater in patients with the more severe deformities and also greater in those with paralytic scoliosis (23 [31%] of 75 patients) than in those with metabolic scoliosis (31 [19%] of 167 patients). Pseudarthroses were explored and were repaired in 23% of the patients treated in the turnbuckle jacket and in 17% of those treated in the localizer cast. Early recognition and repair of pseudarthrosis or extension of a fusion area which is too short prevent further loss of correction and increasing deformity in those patients in whom vertebral growth is not yet complete.

Experimental Ligation of the Internal Mammary Artery and Its Effect on Coronary Occlusion. D. C. Sabiston Jr. and A. Blalock. Surgery 43:906-912 (June) 1958 [St. Louis].

Enthusiastic reports have been received from Italy about the ligation of the internal mammary artery in the treatment of coronary arterial insufficiency, and the procedure has also been advocated in this country. The authors investigated in animals the volume of blood flowing through the internal mammary artery after acute and chronic ligation and studied the role of this procedure in protecting the heart subjected to ligation of a major coronary artery. The volume of blood flow in the internal mammary artery was determined after experimental ligation of this vessel in the second intercostal space in 3 groups of dogs. The flow was measured immediately after ligation in some experiments and after an interval of weeks in others. The volume of flow was found to be quite small both times, with correspondingly low values for back-pressure and back-flow. Small arterial communications between the internal mammary branches and the perivascular arteries along the great vessels entering the heart could be demonstrated by injection techniques, although no protection of the heart against deliberate ligature of the anterior descending coronary artery was found. Blood flow in the internal mammary artery was significantly increased in the chronic preparation, in those experiments in which concomitant ligation of the remaining branches of the subclavian artery was performed. Despite the increase in flow, back-pressure, and back-flow consistently observed under these circumstances, no protection appeared to be offered the heart when challenged by ligation of the anterior descending coronary artery. It is concluded that the volume of blood flowing through the internal mammary artery after ligation in the second intercostal space is quite small and that the procedure does not protect against experimental coronary occlusion.

Experiences with Myocardial Revascularization by Division of the Internal Mammary Arteries. R. P. Glover, J. R. Kitchell, R. H. Kyle and others. Dis. Chest 33:637-657 (June) 1958 [Chicago].

Experiences of Italian investigators with ligation of the internal mammary arteries in patients with myocardial infarcts induced the authors to investigate this treatment first in experiments on dogs. Later they performed the operation on 92 patients (73 men and 19 women). The performance of a bilateral division of the internal mammary arteries, as compared with other surgical procedures for cardiac disease, is safe, simple, and innocuous. Yet, although the technical risk is negligible, one must remember that the disease being treated is highly lethal. Fifty of the authors' patients have been followed up for from 1 to 5 months and form the basis of this initial analysis. By conservative clinical evaluation 34 (68%) of these 50 patients either lost their symptom of pain or were immeasurably relieved of their discomfort. The remainder were unimproved. Objective evidence of clinical improvement lagged well behind the observed clinical improvement. In 13 (26%) of the patients the electrocardiographic tracings, taken 1 month or more after surgery, showed obvious improvement, and the same might be said of 9 (18%) of the ballistocardiographic studies obtained. Both electrocardiographic and ballistrocardiographic evidences of improvement occurred on only 1 occasion in the same patient. Objective signs for the better were present in 22 (42%) of the patients.

The studies reported confirm the findings of the Italian investigators. However, considerable reservation as to the ultimate place of this surgical procedure is warranted. Whether it will eventually remain as a surgical entity on its own merits or whether it will be used as an adjunct to other surgical techniques cannot be decided until much more investigative work, both experimental and clinical, has been carried out.

Successful Resuscitation in Acute Myocardial Infarction with Ventricular Fibrillation. D. K. Bloomfield and J. A. Mannick. New England J. Med. 258:1244-1247 (June 19) 1958 [Boston].

The authors report the case of a young man who suffered acute myocardial infarction with subsequent cardiac arrest and ventricular fibrillation. He was successfully resuscitated by thoracotomy, cardiac massage, and electric defibrillation. In none of the 3 patients reported in the medical literature in the past 2 years, in whom ventricular fibrillation developed presumably as a result of acute myocardial infarction and who were successfully resuscitated by thoracotomy, cardiac massage, and defibrillation, was the diagnosis of acute myocardial infarction fully established prior to the institution of resuscitative measures. Electrocardiograms taken later showed the pattern of infarction. The authors' patient was discharged, fully ambulatory, on the 39th hospital day. The prognosis in the case reported to date seems favorable. The patients of Beck and associates and of Reagan, Young, and Nicholson are reported as well and active 2 and 4 years, respectively, after resuscitation by cardiac massage.

Postoperative Venous Thrombosis and Pulmonary Embolism in Lung Surgery. G. Merlo. Minerva chir. 13:511-516 (May 15) 1958 (In Italian) [Turin, Italy].

The author analyzes the postoperative complications of venous thrombosis and pulmonary embolism which affected 14 of 480 patients, aged between 45 and 62 years, who underwent lung surgery. Phlebothrombosis was present in 9 patients (1.87%) and involved 6 times the veins of the left leg, twice those of the right leg, once both legs, and once the left arm. Seven patients were operated on for carcinoma, 1 for echinococcus cyst, and 1 for bronchogenic cyst. Phlebothrombosis manifested itself between 8 and 21 days after the operation. The period between the appearance of the first symptoms and the remission of phlebothrombosis varied between 6 and 13 days. Pulmonary embolism appeared in 1 patient with phlebothrombosis 2 days after the latter disorder developed, and the patient died shortly afterward. Seven patients had arterial hypotension. Electrocardiographic patterns of the patients showed no significant alterations. Pulmonary embolism developed in 5 patients (1.02%) who had undergone lung surgery. Two were operated on for carcinoma, 2 for bronchiectasis, and 1 for chronic abscess. The period between the operation and the appearance of pulmonary embolism varied between 5 and 46 days. The embolism developed mostly a few weeks after the intervention and ran a fatal course in all 5 patients. The proportion of patients in this series in whom phlebothrombosis developed as a postoperative complication to lung surgery is similar to that which usually follows other types of surgical treatment. Consequently, lung surgery is from this point of view no more hazardous than any other type of operation.

The Surgical Treatment of Pulmonary Tuberculosis in the Mentally Ill: A 5-Year Study of 403 Resections. A. Mowlem, C. J. Connolly and B. Zimmermann. Surgery 43:913-925 (June) 1958 [St. Louis].

The authors present a review of the surgical experience obtained from 403 pulmonary resections performed on 338 patients during a 5-year period from July 1, 1952, when tuberculosis therapy at Anoka State Hospital became a cooperative effort with the department of surgery of the University of Minnesota, to June 30, 1957. The patients were adult psychotic and mentally defective individuals transferred to Anoka from the 10 mental institutions in Minnesota. They were referred on the basis of positive cultures of gastric washings or suspected lesions on roentgenograms. Upon arrival 6 consecutive cultures of gastric washings were obtained prior to instituting antibiotic therapy. Patients with minimal disease, whose lesions regressed progressively within 2 or 3 months after institution of medical therapy and whose lesions eventually disappeared, were not considered surgical candidates. Patients whose lesions regressed after a few months of antibiotic administration to small and stable nodular residuals without open cavities were operated on, and their lesions excised. Patients with active endobronchial tuberculosis were not operated on until these lesions healed. When possible, surgery was also deferred on patients with open cavities until these became smaller, became sealed off from the tracheobronchial tree, or healed leaving only small solid residual foci. Patients with positive gastric cultures at the time of the proposed operation were not operated on except when their lesions enlarged despite antibiotic treatment and the need for prompt removal of the focus of spread became evident. Patients with far-advanced bilateral lesions too extensive for resection without sacrifice of inordinate amounts of functioning pulmonary tissue were not operated on and were treated medically. Planigraphy, bronchoscopy, bronchography, and other diagnostic procedures were utilized when indicated in the evaluation of extent of disease prior to operation.

The results reported represent follow-up periods of from 5 years to 4 months. Two hundred eighty-nine segmental resections, 67 lobectomies, 23 pneumonectomies, and 24 wedge resections were carried out in unilateral, staged bilateral, and bilateral simultaneous procedures, with an over-all operative mortality rate of 8.2% and a patient mortality rate of 9.7%. Of the 33 surgical deaths, 16 occurred within 1 week, and 17 occurred later. Seven of the early deaths were caused by acute respiratory embarrassment and pulmonary edema. The need for accurate preoperative evaluation of pulmonary function by differential bronchospirometric and other studies in cases being evaluated for extensive resection is evident. Aside from these 7 cases, no relationship was evident between the extent of resection and deaths. Postoperative pneumonitis accounted for 8 deaths. Of the patients with complications attributable to the pulmonary resections, 51 recovered, whereas 5 still have complications. Four of these 5 have postoperative spread and late reactivation, and 1 has an occult bronchopleural fistula and is awaiting a thoracoplasty. The necessity for operating on some patients in a group such as this on the basis of roentgenologic findings alone is demonstrated by the finding of active disease in resected specimens of patients who had never had positive gastric cultures preoperatively.

End Results in the Treatment of Gastric Cancer. G. McNeer, W. Lawrence Jr., M. P. Ashley and G. T. Pack. Surgery 43:879-896 (June) 1958 [St. Louis].

This study deals with the end-results obtained in patients with adenocarcinoma of the stomach seen by members of the gastric service of the Memorial Center for Cancer and Allied Diseases in New York in the years from 1931 through 1955. Some form of operation was performed on 1,315 patients, that is, on 81% of the 1,623 patients observed. Due to the pessimistic view toward cancer of the stomach in the earlier period (1931 through 1940), only 65.8% of the patients were considered suitable for surgical treatment. In contrast, 90.8% of the patients seen in the years from 1951 through 1955 were deemed to have operable disease. In the earlier years (1931 through 1940), resection was rarely performed except with the intent of cure, and was carried out in 15.5% of all the patients seen. The frequent performance of some form of bypass procedure, such as gastrostomy, jejunostomy, or gastroenterostomy, reflected the general attitude of surgeons toward patients with cancer of the stomach. In the years from 1941 through 1955 the development of endotracheal anesthesia, the perfection of thoracic surgery, and the discovery of antibiotics enabled surgeons to offer resection to a larger number of patients (41.6%). Whereas some form of bypassing procedure comprised 97.7% of all palliative operations in the years from 1931 through 1940, only 25.7% of similar cases were so treated from 1951 through 1955. Subsequent studies revealed that patients with incurable gastric cancer were appreciably benefited only by resectional procedures.

Resection was possible in 34.1% of the 1,116 men and in 33.5% of the 507 women. There was a progressive increase in resectability rates with rising age from 30 to 80 years. Resectability was low in patients under 40 and over 80 years of age. The patients with a short history of symptoms had a higher proportion of inoperable lesions than those with a longer history. If the symptoms were less than 3 months in duration, inoperability was 17.6%. This figure fell to 8.6% when symptoms were over 3 years in duration. The effect of the duration of symptoms on resectability was similar but less marked. The symptoms of carcinoma of the stomach follow 3 general patterns: prolonged "indigestion," the ulcer syndrome, and weakness due to anemia. Resectability (1941 through 1955) was highest in patients with the ulcer syndrome (54.5%), followed by 47% for those with anemia only and 41% for those complaining of nonspecific indigestion. The presence of a palpable mass was not accompanied with as high a curability rate as the absence of this symptom, but 30.7% of this group had a resectable lesion. A total of 197 of the 1,315 surgically treated patients (15%) died in hospital as the result of operation. All the patients under the age of 40 survived surgery; with each succeeding decade postoperative mortality increased. Postoperative mortality also increased with the size of the tumor.

Ninety-one (or 21.6%) of the 422 patients who were subjected to curative resections remained well for 5 years or more. The 5-year survival rate was 28.3% in men and 24% in women. The patients who were treated within the first 3 months after onset of symptoms had a lower survival rate (15.3%) than those treated from 6 to 24 months after onset of symptoms (26.1%). A far more fulminant variety of gastric cancer was usually encountered in the patient who sought diagnosis within 3 months of the first symptom. The outlook for the patient with carcinoma of the middle segment was nearly twice as favorable as for the patient with carcinoma located in the cardia. Penetration of the gastric serosa by cancer was followed by a lower survival rate than when the cancer had remained in the mucosal and muscular layers. The microscopic grade of the tumor also influenced the survival rate. That nodal metastasis played a role was demonstrated by the fact that in 62 (or 68%) of the 91 patients who survived 5 years or more after resection the lymph nodes were not involved. The inherent pathological capacities of each gastric cancer to grow and disseminate had the greatest impact on the end-results. However, successful results after radical surgical treatment of some lesions with unfavorable features is encouraging.

Calcification in Gastrointestinal Malignancy. W. A. Matthews, J. E. Skandalakis, M. A. Mitchell and H. S. Weens. Gastroenterology 34:959-968 (June) 1958 [Baltimore].

The authors present the histories of 2 patients with gastrointestinal carcinoma in whom calcium deposits were demonstrated. The first patient was a 59-year-old woman who complained of poor appetite, constipation, and weight loss of 20 lb. (9.1 kg.). The physical examination was not remarkable except for tenderness in the epigastrium. On roentgenologic examination a gastrointestinal series revealed that the gastric lumen was narrowed throughout the midportion and distal portion of the stomach. Both lesser and greater curvatures showed an irregular, finely serrated profile. The pylorus was patent. Along both lesser and greater curvatures above the angle of the stomach, bands of increased density were noted, representing the thickened gastric wall which contained numerous small, mottled calcium deposits. The impression was that the lesion represented an infiltrating gastric carcinoma containing numerous stippled calcium deposits. A subtotal gastrectomy and gastrojejunostomy were performed. The histological examination of the specimen disclosed a mucinous adenocarcinoma of the stomach with many calcium deposits filling the mucinous spaces. Eighteen months after the operation the woman remained free of significant symptoms.

The second patient was a 25-year-old man who complained of periumbilical, right lower quadrant pain, nausea, and vomiting. The physical examination disclosed rebound tenderness in the middle and lower parts of the abdomen on the right. The base of the umbilicus was indurated. The rectal examination revealed anteriorly an extrinsic mass, 2 to 4 cm. in diameter. The patient was considered to have an abdominal carcinoma or lymphoma. A survey film of the abdomen showed large amounts of feces and gas scattered throughout the entire large intestine, including the rectal segment. A number of small, mottled, dense deposits were noted in the descending colon at the level of the iliac crest. A barium enema revealed the mottled deposits. At the level of the mottled densities a well-defined filling defect with shelf-like edges was encountered. The mucosal pattern in this region was distorted. The impression was that the lesion represented a carcinoma of the large intestine. A biopsy specimen from the indurated umbilicus disclosed a mucus-producing adenocarcinoma considered to be metastatic. A palliative colostomy was attempted but could not be carried out because of massive intestinal adhesions. The patient died 2 days later. The autopsy disclosed a mucinous adenocarcinoma, with metastases to the regional lymph nodes, peritoneum, omentum, mesentery, and diaphragms. The histological examination revealed calcium deposits in the mucinous spaces of the carcinoma.

A review of the literature revealed 8 similar cases The important data on all 10 patients are tabulated 8 had carcinoma of the stomach, and 2 had carcinoma of the colon and rectum. On reviewing the previously reported cases, a striking similarity of the calcifications becomes apparent. These deposits appear small, rarely measuring more than a few millimeters in diameter. They are arranged in a stippled and tortuous pattern, following largely the contour of the involved gastrointestinal segment. Contrast studies reveal a marked constriction of the involved gastrointestinal lumen due to the diffuse infiltrating character of the neoplasm. These calcifications are sufficiently characteristic to make it possible to render a preoperative diagnosis of carcinoma in these patients.

Treatment of Peritonitis of Appendicial Origin With and Without Intraperitoneal Terramycin. K. O. Adwan, F. E. Lumpkin, J. A. Stirman and B. J. Wison. Am. Surgeon 24:452-457 (June) 1958 [Baltimore].

During the period from 1950 to 1954, 78 patients with acute appendicitis with either perforation or gangrene were treated by appendectomy at the Parkland Memorial Hospital in Dallas. These patients were found by a review of operative records and the pathologists' gross and microscopic descriptions of the removed appendix; they served as a control for 52 patients, seen from 1955 through 1957, in whom the presence of perforation or gangrene was established by gross inspection at the time of laparotomy. The inadequacy of Terramycin given exclusively in the intraperitoneal cavity without other parenterally administered antibiotics is attested by the death of animals after experimentally produced appendical rupture. Accordingly, this investigation permitted the customary use of parenterally administered antibiotics, while Terramycin was given intraperitoneally in order that no life might be needlessly placed in jeopardy and in order that the patients treated in the previous 4 years might serve as controls, since the only deviation in management was the addition of intraperitoneally administered Terramycin in the experimental group. The patients in both the experimental and the control groups were given a mean daily dose of approximately 1.2 million units of crystalline penicillin and 1 Gm. of streptomycin. Broad-spectrum antibiotics were administered systemically to 55% of the early group and 46% of the experimental (late) group, the only difference in antibiotic therapy being the Terramycin peritoneal infusion for the patients in the experimental group.

Although gross leakage of lumenal contents from the appendix was found during laparotomy in nearly two-thirds of the patients who subsequently received Terramycin, only 55% of the control group demonstrated leakage and only 1 in 4 of this group exhibited localized accumulations of pus in conjunction with perforations in contradistinction to the 1 in 3 patients similarly disposed in the experimental group. The differences in the mortality rate were not significant. A pronounced decrease in intraperitoneal abscess formation was observed when Terramycin was used postoperatively, one-third fewer patients requiring surgical drainage. The incidence of intraperitoneal inflammatory mass exclusive of abscess was higher in the patients given an intraperitoneal antibiotic. The duration of ileus is not significantly longer in patients receiving Terramycin, indicating that the preparation does not appreciably influence the incidence of chemical peritonitis, which is manifest by paralytic ileus. No significant difference in the frequency of wound abscesses was noted or expected, and no antibiotic other than Terramycin is thought to be so safe, yet effective, when given into the peritoneal cavity of man in the treatment of bacterial peritonitis.

Surgical Treatment of Massive Upper Gastrointestinal Hemorrhage. D. R. Cooper, L. H. Stahlgren, L. E. Sylvester and L. K. Ferguson. Gastroenterology 34:947-958 (June) 1958 [Baltimore].

The physician who is confronted by a patient who is bleeding massively from the upper gastrointestinal tract is often hard pressed to choose between the operative and the nonoperative approach. Answers should be provided to the following questions in order to assess properly the role surgery will play in the patient's treatment: 1. Is the bleeding massive? 2. Is the bleeding point located in the upper gastrointestinal tract (i. e., proximal to the ligament of Treitz)? For practical purposes, this fact is established by the presence of hematemesis, bloody gastric aspirate, or a positive Einhorn string test. 3. Is there any evidence to suggest the presence of esophageal varices? A history of chronic intake of alcohol or previous liver disease may be elicited. Before the obvious signs of far-advanced liver disease and portal hypertension appear, splenomegaly may be the only suggestion of early portal congestion. 4. Is there any evidence of a bleeding tendency? Bleeding, coagulation. and prothrombin times are routinely obtained.

The authors report results obtained in a series of 46 patients who underwent emergency gastrectomy for upper gastrointestinal hemorrhage. The cases represent their combined experience over a 5-year period at the Graduate Hospital of the University of Pennsylvania and the Hospital of the Woman's Medical College of Pennsylvania (1951 to 1956) and over a 2-year period at the Philadelphia General Hospital (1954 to 1956). They comprise approximately 7% of all operations on the esophagus, stomach, and duodenum during this time. There were 34 men and 12 women in this series. The predominance of males is to be expected, since the majority proved to have peptic ulcer disease. The majority of patients were in the older age group, the peak incidence being in the 7th decade. Eight of the 46 patients (19%) died during or after the operation.

The authors emphasize the following points: 1. Laparotomy to control massive upper gastrointestinal hemorrhage is successful in most patients if care is exercised to localize the bleeding point to the stomach or the duodenum preoperatively. 2. Esophageal varices can usually be excluded by careful history and physical examination, Bromsulphalein determination, and barium study or endoscopy. 3. Routine emergency barium x-ray of the stomach and duodenum during such bleeding is unnecessary. 4. The indications for operation for massive upper gastrointestinal hemorrhage are (*a*) exsanguinating hemorrhage, (*b*) continued bleeding requiring replacement of more than 500 cc. of blood every 8 hours for 48 hours, and (*c*) rebleeding while the patient is hospitalized for antiulcer treatment. 5. The bleeding lesion should be excised unless great risk to contiguous structures is involved. In such a circumstance a simple ligature may be lifesaving. 6. Gastrotomy and/or duodenotomy are not recommended except in unusual circumstances. 7. At operation for proved upper gastrointestinal hemorrhage, if no lesion is apparent on external inspection and palpation of the viscera, and if varices have been excluded, blind gastric resection can be done with reasonable assurance that the bleeding point will be controlled (88% in this series). 8. Emergency gastrectomy is attended by a higher mortality rate than is elective gastrectomy, largely because of the precarious state of these acutely bleeding and depleted patients. 9. The mortality rate can be lowered chiefly by earlier decision for or against surgical intervention. 10. Some patients will be salvaged by operation who would bleed to death on conservative treatment.

Emergency Surgical Treatment of the Severely Bleeding Duodenal Ulcer. J. C. Westland, H. J. Movius and J. A. Weinberg. Surgery 43:897-900 (June) 1958 [St. Louis].

At the Veterans Administration Hospital in Long Beach, Calif., one of the authors began in 1949 a new treatment for severely bleeding duodenal ulcer. The bleeding vessel is ligated with a transfixion suture; then a simple pyloroplasty of the Heineke-Mikulicz type is completed, and a vagotomy performed. When this program was first adopted, the operation was done in 2 stages; the ligation and pyloroplasty were performed in the first stages, and the vagotomy a week or 2 later when the patient's general condition would be more favorable for the additional procedure. However, later the operation was changed to a 1-stage procedure. This report is concerned with the 30 patients who were treated for massive duodenal ulcer bleeding during the 7 years from 1949 to 1956. All the patients showed evidence of hypovolemic shock during the bleeding episode. The average period of intensive medical therapy prior to operation was 80 hours. The patients received an average of 8 units of blood each in the several days before operation. Blood was administered also during the operation, frequently into more than 1 vein.

Of the 30 patients operated on, 24 had ligation, pyloroplasty, and vagotomy in a single stage. The other 6 patients had ligation and pyloroplasty in the initial operation, with vagotomy contemplated as a later procedure. There were no deaths in the 24 patients treated by 1-stage transfixion ligation, pyloroplasty, and vagotomy. One of the patients required 2 additional operations 1 and 2 weeks later because of recurrence of bleeding. At the third operation in this patient, a Billroth 2 gastric resection was performed, with eventual satisfactory recovery. It is believed that recurrence of bleeding was due to the failure to place the figure-of-eight transfixion suture deep enough at the original operation. One of the 6 patients, in whom operation was limited to ligation and pyloroplasty in the initial stage, died of a recurrent hemorrhage without vagotomy having been added. It was then decided to make a practice of combining the 3 procedures of ligation, pyloroplasty, and vagotomy in a single operation. The results indicate that this is a simple, effective means of dealing with the actively bleeding ulcer which threatens the life of the patient.

NEUROLOGY & PSYCHIATRY

Neurosurgical Aspects of Occlusive Cerebral Vascular Disease. J. E. Webster, E. S. Gurdjian, D. W. Lindner and W. G. Hardy. Radiology 70:825-831 (June) 1958 [Syracuse, N. Y.].

The authors evaluate the "stroke syndrome" from a neurological point of view, based upon angiographic studies correlated with the clinical aspects of the various abnormalities in cerebral blood flow. A multiplicity of lesions described as strokes have been found in a study of 200 patients admitted to a cerebral vascular ward for purposes of a complete neurological evaluation employing angiographic studies. Occlusive carotid artery disease was found to be a strikingly common cause for cerebral vascular insufficiency and failure. In conjunction with complete neurological studies, all the patients were evaluated by digital carotid artery compression. This valuable and decidely safe method has been used to determine the extent of cerebral vascular insufficiency in the presence of hemiparesis and hemiplegia. Should syncope occur upon compression, a contralateral complete or partial carotid occlusion, an anterior cerebaral artery occlusion, or a basilar artery involvement is indicated. A sensitive carotid sinus reflex, which can be interrupted by 1/100 grain (0.6 mg.) of atropine, masks these responses. Syncope does not usually occur in patients with mass lesions or occlusion of the middle cerebral artery or its branches.

The patients with complete carotid artery occlusion have been treated surgically by excision of a segment of the involved artery and cervical sympathectomy. Patients with segmental atheromatous involvement of the carotid bulb and the internal and external carotid arteries at their origins have been treated by an intimectomy with removal of the plaques and stenotic areas. The latter group of patients have been previously treated with anticoagulants and carotid compression to induce collateral blood flow. Anticoagulant therapy is used in the treatment of anterior, middle, and basilar occlusions before cerebral vascular failure with paralytic signs occurs. Patients are also instructed in the use of daily carotid compression in order to dilate and increase the vascular channels to improve collateral blood flow.

Resection of the Temporal Lobe in Patients with Convulsive Disorders. L. A. French. Minnesota Med. 41:373-376 (June) 1958 [St. Paul].

The authors report on the surgical removal of the temporal lobe to control convulsive seizures in 25 of a series of 50 patients who were operated on for temporal lobe epilepsy. The patients, 21 of whom were male and 4 were female, were selected for surgery on the basis of having (1) clinical evidence of temporal lobe seizures without control by the usual anticonvulsant medications and (2) assaultiveness as a conspicuous part of the seizures. One patient died 2 weeks after operation from a transfusion reaction, 2 patients were aphasic for 3 to 4 weeks postoperatively, 4 patients presented homonymous hemianopsia, 4 others exhibited a quadratic visual field defect, 2 patients had transient postoperation hemiparesis, and 2 developed a moderately severe and persistent hemiparesis. In addition to the temporal lobe seizures, 16 of the 25 patients had attacks of other types (petit mal, grand mal), making evaluation difficult. Of the 24 patients who survived the operation, 12 (50%) have been free of seizures of all types. In no instance did the procedure aggravate the frequency or severity of the preexisting pattern. A total of 19 patients have been relieved of their psychomotor seizures. Two patients in a group of 9, in whom careful follow-up studies were done, are reported as being more disorganized after surgery, 3 are unchanged, and 4 are improved.

Prefrontal Lobotomy: Final Report of 500 Freeman and Watts Patients Followed for 10 to 20 years. W. Freeman. South. M. J. 51:739-745 (June) 1958 [Birmingham, Ala.].

Freeman and Watts presented their first report on lobotomy in 1936. They used the technique of Egas Moniz and Almeida Lima in the first 20 patients. The results were dramatic in some but inadequate in others; 8 of the patients were again operated on later, 2 of them a third time. The remaining 12 patients had lesions placed in the inferior quadrants, but the operation was not precise, and in some instances hemorrhage occurred, followed by death or serious personality disorder. Some of the patients, however, have done extremely well for up to 20 years. Beginning in 1938, the author and Watts entered the frontal lobes through bur holes placed laterally in the cranium and developed a method for precise incision in the plane of the coronal suture. With further experience they were able to design the lobotomy to what they deemed were the needs of each patient; they limited incisions for patients with affective or psychoneurotic disorders and designed more extensive ones for those with chronic schizophrenia. By 1944, they were carrying out very radical operations in severe cases and particularly in those of younger patients. Transorbital lobotomy was begun in 1946.

By the middle of 1947, Watts and Freeman had operated on 551 patients, some of them twice or even 3 times. In the decade that followed, 90 patients had died, and 21 more in the 10-to-20 year period. The others have all been heard from in recent months, so that 440 are available for study at least 10 years after their first operation. Half of the surviving patients are still employed or keeping house. Failures are attributable to such factor as emotional deterioration, progress of disease, relapse due to inadequate operation, accompanying physical disease, organic brain disease, and onset in childhood. When lobotomy arrests the mental disorder, a substantial number of patients improve progressively over a period of years, mature in their social adjustment, and attain higher levels than could reasonably have been anticipated without the lobotomy. It was found that it requires about 2 years for the patient who has had lobotomy to stabilize, but thereafter there is a long period of consistent performance. Relapses may occur, even long after operation, but these are about balanced by late improvements.

Intracranial Arteriovenous Aneurysms: A Study of Their Effect on the Cardiovascular System. O. Höök, L. Werkö and G. Öhreberg. A. M. A. Arch. Neurol. & Psychiat. 79:622-632 (June) 1958 [Chicago].

In order to determine whether heart complications in patients with arteriovenous aneurysms are actually due to overloading of the heart as a result of large arteriovenous shunts, 13 patients with intracranial and 1 with extracranial arteriovenous aneurysms were subjected to thorough cardiac investigation. In addition, the histories of 123 patients with intracranial arteriovenous aneurysms and 10 patients with carotid artery–cavernous sinus fistulas were reviewed with particular attention to the occurrence of objective or subjective cardiovascular symptoms. The 14 patients included 9 men and 5 women, ranging in age from 16 to 63 years, with a mean duration of clinical symptoms of 16 years. Only 2 of these patients revealed any important symptoms referable to the cardiovascular system; dyspnea upon exertion and auricular fibrillation at rest were found in one patient, and the other exhibited mild symptoms of angina pectoris after exertion. Bicycle-ergometer tests carried out on 12 of the 14 patients yielded comparatively normal results.

The cardiac output in the cases of intracranial arteriovenous aneurysms studied was normal or low and showed no correlation with the size of the aneurysms. Likewise, the blood pressure, including the pulse pressure in the arterial system, was normal in all instances. Renal clearance tests were all within normal limits. Hypertension (systolic pressure, greater than 170 mm. Hg; diastolic pressure, greater than 100 mm. Hg) was present in 5 cases. Pathological electrocardiographic changes occurred in 3 cases without other accompanying symptoms, while subjective heart symptoms were found in only 1. Objective decompensation symptoms were not demonstrated in any of the patients.

These studies have provided no basis for the assumption that intracranial arteriovenous aneurysms result in shunts of such magnitude as to overload the cardiovascular system. All values for cardiac index, pressure in the pulmonary circulation, and renal clearance lay within normal limits. This study is compared with that of Warren, Nickerson, and Elkin, in which the cardiac indexes of arteriovenous aneurysms, all extracranial, were high. The index of aneurysms in the femoral and iliac regions was between 6.0 and 7.1 liters, while that of aneurysms in the carotid, vertebral, and subclavian arteries was of the order of 4.0 to 4.5 liters per minute per square meter of body surface area. Thus, in the latter study there was a tendency to smaller shunts near the cranium. It was not possible to demonstrate in the 123 patients with intracranial arteriovenous aneurysms and the 10 patients with carotid artery–cavernous sinus fistulas symptoms indicating an increased load on the heart and circulation which could be caused by arteriovenous aneurysms.

Gliomas of the Optic Nerves. H. W. Dodge, J. G. Love, W. McK. Craig and others. A. M. A. Arch. Neurol. & Psychiat. 79:607-621 (June) 1958 [Chicago].

A recent study of tumors of the orbit and its contents revealed that a fair proportion of the growths take origin from the optic nerve. Primary neoplasms of the optic chiasm and of the optic tract were as common as those of the orbital segment, and regardless of the point of origin or extent of the process, these new growths had similar microscopic characteristics and were gliomas rather than neurofibromas. The large number of children affected suggests a congenital origin, and the not infrequently associated phenomenon of neurofibromatosis (von Recklinghausen's disease) implies a hereditary type of neoplasm. These observations were confirmed in the literature. The present study was undertaken to correlate certain clinical and pathological features in an effort to establish criteria for early diagnosis.

The 46 patients in this series were divided into 2 groups on the basis of the surgical and pathological observations of the lesion. The first group included 12 patients, each of whom was found to have a glioma limited to the optic nerve. The most outstanding finding in this group was proptosis, nearly all patients giving it as their initial complaint. Six of the 12 patients had loss of vision of the affected eye, and only 2 had normal visual acuity in each eye. Strabismus was a frequent finding in this group, and in several patients it was the initial abnormality noted. Seven patients were found to have unilateral papilledema, which varied in degree but usually tended to be severe. The ages of the 12 patients ranged from 2 to 21 years. Most of the patients were young children, 10 of them being girls.

The second group included 34 patients, each of whom had a more diffuse glioma that involved the chiasm or the optic tract. Loss of vision, usually bilateral, was the outstanding symptom in this group, and it was the symptom for which the majority of the patients sought help. Bilateral loss of vision was found in 23 patients, the field defects usually being of a bitemporal or incongruous homonymous nature. Six of the 34 patients had proptosis and were found to have involvement of the intracranial visual apparatus. Pallor of the disks, present in 21 patients, was bilateral in all but 4. While papilledema occurred in 58% of group 1 (optic nerve group) and pallor in 25%, the opposite was true of group 2 (chiasmal group) in which pallor occurred in 62% and papilledema in 32%. The patients in group 2 were older than those of group 1, and there were more males (19) than females (15), suggesting that males and females are almost equally affected when the glioma involves the chiasm.

Routine roentgenograms of the heads of the 12 patients in whom only 1 optic nerve was known to be involved did not show any evidence of abnormality. In only 4 of the 34 patients with glioma that involved the optic chiasm were roentgenograms considered to be entirely normal. Nine of the 46 patients manifested evidence of a disturbed endocrine function before the diagnosis of glioma of the optic nerve was established. The 9 patients, in each of whom the tumor arose within the cranial cavity, were found to have precocious puberty, obesity, mental retardation, and pituitary insufficiency.

Pathologically, the tumors were divided as follows: type A, tumors of the optic nerve, 12 patients; type B, tumors of the optic chiasm, 14; and type C, "tractal" or diffuse tumors, 20. All type A tumors were unilateral and were found microscopically to be astrocytomas; only 1, however, was considered to be an active (grade 3) neoplasm. Of the type B tumors, 1 was a grade 3 oligodendroglioma, the remaining 13 being astrocytomas. Of the 20 type C lesions, 17 were bilateral with respect to the chiasm and tract; 15 were grade 1 astrocytomas, 4 were grade 2 astrocytomas, and the remaining lesion was a grade 3 astrocytoma.

The transcranial surgical approach is considered as the most favorable as it provides: (1) excellent direct visualization of the orbit and anterior visual pathways; (2) more adequate control of hemorrhage; (3) lessened need of blind palpatory exploration of orbital contents; (4) added postoperative decompression of orbital contents; (5) opportunity for exploration of orbital contents and intracranial portions of the optic nerve simultaneously; (6) bilateral visualization of the anterior optic pathways; (7) hidden intrahairline scalp incision; and (8) opportunity for total removal. These studies indicate an excellent prognosis for unilateral lesions of the optic nerve, the more diffuse lesions of the tract and chiasm receiving a somewhat less favorable prognosis.

Meprobamate Habituation: A Controlled Clinical Study. T. M. Haizlip and J. A. Ewing. New England J. Med. 258:1181-1186 (June 12) 1958 [Boston].

A "double-blind" study was conducted with 3 groups of 25 patients receiving identical placebos or meprobamate in doses of 6.4 Gm. or 3.2 Gm. daily. Clinical observations revealed severe sedative effects during the first 3 days, 35 patients out of 47 showing staggering gait or inability to stand or walk without falling. At the end of 40 days all the patients were switched surreptitiously to placebos. Clinical observation revealed objective evidence of an abstinence syndrome in 44 of the 47 patients who previously received meprobamate. The typical withdrawal syndrome included various degrees of insomnia, vomiting, tremors, muscle twitching, anxiety, anorexia, and ataxia. Eight patients showed a picture of hallucinosis with marked anxiety and tremors resembling delirium tremens. Grand-mal seizures developed in 3 patients. The effects and the withdrawal syndrome of meprobamate at both dose levels were statistically significant. It is concluded that meprobamate closely simulates the effects of the barbiturates but has advantages over the barbiturates. It seems wise to start the drug slowly and to discontinue its use slowly to prevent the occurrence of withdrawal symptoms.

Novobiocin in the Treatment of Staphylococcal Meningitis. M. Giusti and S. Mori. Riv. clin. pediat. 61:177-194 (March) 1958 (In Italian) [Florence, Italy].

Novobiocin was administered in daily doses of 10 to 40 mg. by the ventricular, lumbar, or intracisternal routes, supplemented by the oral route, to 6 patients with staphylococcic meningitis; 4 of the patients were children, 1 an adolescent, and 1 an adult. The primary form of the disease was present in 2 patients, and a purulent complication of an active tuberculous meningitis in 4. Novobiocin combined with other antibiotics produced a complete remission of the disease within 6 to 8 days of treatment. No side-effects were observed after the discontinuance of the chemotherapy. The authors believe that staphylococcic meningitis should be treated "in situ." Novobiocin is in this respect superior to all other antibiotics with the exception of erythromycin.

The Effect of Meprobamate (Equanil) on Brain-Damaged Patients. C. H. Carter. Am. J. M. Sc. 235:632-638 (June) 1958 [Philadelphia].

Meprobamate (Equanil) is a mephenesin derivative. It possesses both muscle-relaxant and ataractic properties. By virtue of its dual activity, it appeared that meprobamate might prove efficacious among certain types of brain-damaged patients. At Florida Farm Colony it was given to (1) a group with neuromuscular disorders, including athetosis, spasticity, ataxia, and paralysis agitans; (2) a group with behavior problems, ranging from mild anxiety and tension over a handicap to frank psychoses; and (3) a group combining the more severe features of both conditions. The only criterion for the selection of the 105 institutionalized patients treated was brain damage demonstrable by abnormal electroencephalographic tracings. Many patients had a history of natal, neonatal, or postnatal trauma. All patients had received appropriate but conventional therapy for at least 6 months prior to admission to the study. Twenty-two of the patients had previously received other drug therapy. Seventeen of the 22 were athetoid or spastic cerebral palsy patients, who had taken 1 or more of the following drugs: mephenesin plus glutamic acid, reserpine tablets or elixir, chlorpromazine, trimethadione, and diphenylhydantoin sodium. While all these drugs had been withdrawn gradually before the study began, previously introduced physical therapy or psychotherapy continued unchanged throughout the meprobamate regimen.

Dosage of meprobamate was adjusted to the individual needs of each patient. In 12 cases, the drug was administered 4 times daily; the remaining patients received meprobamate 3 times daily. The predominant daily dose was 1,200 mg. and ranged from 400 mg. to 3,600 mg. Meprobamate proved to be the drug of choice. More than 80% of the spastic and 97% of the athetoid patients responded with at least moderate remission of their neuromuscular symptoms. Behavioral problems almost vanished in 57% of the patients and were moderately relieved in 97%. Improvement was maintained over a 2-year period while medication continued at dosages of up to 3,600 mg. daily. Many patients improved sufficiently to benefit from physical therapy or psychotherapy for the first time. The only side-effect noted was drowsiness, and this occurred in only 11 patients.

GYNECOLOGY & OBSTETRICS

Cytodiagnosis in Cancer of the Cervix. I. H. Cutts. Canad. M. A. J. 78:825-830 (June 1) 1958 [Toronto].

Of 6,134 smears of vaginal or cervical origin which were received for cytological examination at the Pathological Institute in Halifax, N. S., between 1952 and 1955, 242 were graded as positive for malignancy. Further investigation by biopsy or conization revealed infiltrating carcinoma in 206 of the 242 specimens, carcinoma in situ in 14, doubtful lesions in 10, and negative findings in 12. Twelve cases of cancer of the cervix, unsuspected clinically, were diagnosed with the aid of cytological means and later confirmed from conization material. Of 123 additional smears which were graded cytologically as of doubtful or suspicious nature, 93 were subsequently investigated by biopsy or conization, and 58 were ultimately shown to be cases of undoubted carcinoma, 51 being infiltrating carcinoma and 7 carcinoma in situ. Sixty-seven smears, which comprised cells from normal women and from patients with carcinoma in situ, invasive carcinoma, and chronic cervicitis, respectively, were chosen for a detailed study of the individual cells; this study concerned nuclear and cell diameters, nuclear and cell shapes, nuclear and cell borders, cytoplasmic changes, chromatin structure, nucleoli, and degenerative nuclear changes.

While the error for smears graded as positive by cytological examination was less than 10%, the over-all error for positive doubtful and suspicious smears was 22%, and for this reason every positive or suspicious cytological diagnosis should be confirmed by histological study of biopsy specimens. False diagnosis arises either from faulty sampling or from difficulty in interpretation of the microscopic findings. The latter generally produce a false-positive or suspicious report. Observer error is probably implicated. The diagnostic features of cells are referable only to the nucleus. Cytoplasmic changes are ill-defined and common to all the cells studied, regardless of their type. The features found to be of most value, in order of merit, are increased nuclear/cytoplasmic ratio, condensation and wrinkling of nuclear membranes, increased chromatin staining and alteration of the chromatin pattern to a coarsely granular type, presence of macronucleoli, and variation in size and shape of nuclei. Cells which are the morphologic equivalent of cancer cells appear to be formed in the cervix at least some time during the life of many patients in whom cancer cannot be demonstrated. Cytological diagnosis is possible only because in cancer many such cells are seen in the smear. The findings suggest that cancer proceeds in step-like deviations from the normal, and that only in a small number of cases does the process reach full fruition.

The Current Status of the Pregnant Cardiac. J. M. Kaufman and P. E. Ruble. Ann. Int. Med. 48:1157-1170 (June) 1958 [Lancaster, Pa.].

From 1 to 7% of pregnancies are associated with heart disease, and the over-all death rate for these patients is said to be 3%. About 85% of these cardiac patients are rheumatic; 83% of the women with rheumatic heart disease have mitral valve disease alone, and the remaining 17% have multivalvular involvement. The most common cause of death in these patients is congestive heart failure; other causes are sepsis, pulmonary embolism, shock and hemorrhage, toxemia, and subacute bacterial endocarditis. About 25% of the deaths occur during pregnancy, and 75% in the puerperium. Commissurotomy may be indicated in the woman with mitral stenosis who contemplates pregnancy. The authors suggest valvulotomy for the young married woman under the following conditions: (1) when there is dyspnea during ordinary activity; (2) when the physical, electrocardiographic, and roentgenologic findings indicate definite and predominant mitral stenosis; (3) when catheterization is advisable in questionable cases. Hemoptysis and/or embolization may also make valvulotomy advisable.

As the result of their experiences, plus replies they received to questionnaires sent throughout the country, the authors report on pregnancies subsequent to commissurotomies in 96 women. These commissurotomies were followed by 98 normal deliveries. There were no maternal deaths and only 1 fetal death. The patient who is seen in the first trimester of pregnancy and found to have mitral stenosis and early heart failure presents a controversial problem. With very strict cardiac management, many of these patients can be delivered with only minimal risk. The second alternative would be therapeutic abortion and subsequent commissurotomy, with the hope of pregnancy reserved for the distant future. The third possibility would be mitral commissurotomy during pregnancy. A woman with either rheumatic or congenital heart disease should be evaluated both medically and surgically early in pregnancy. When cardiac symptoms appear early and surgical improvement of the heart is possible, surgery is preferable to abortion.

Ninety-three mitral commissurotomies were performed during pregnancy, with 3 early maternal deaths, probably avoidable with present methods of anesthetization and surgery. Eighty-eight live babies were delivered in this group. In 22 patients a patent ductus was sectioned during pregnancy, without maternal mortality and only 1 miscarriage 1 month after surgery. Patients with various other types of congenital heart disease, such as coarctation of the aorta, tetralogy of Fallot, and interatrial and interventricular septal defects, may go through pregnancy safely. Though it is best done before pregnancy, heart surgery is often a safe procedure during pregnancy for mother and baby. Heart surgery is an adjunct to good medical management, and the patient should have the advantage of careful medical management throughout pregnancy, delivery, and the important postpartum period.

Metastases of Hypernephroma in Vagina and Vulva. L. Overbeck. Ztschr. Geburtsh. u. Gynäk. 150:121-145 (No. 2) 1958 (In German) [Stuttgart, Germany].

A 55-year-old woman was hospitalized because of a sudden genital hemorrhage. The hemorrhage was traced to a polypous tumor of bluish-red color on the posterior vaginal wall. A biopsy from the surface of the tumor suggested at first a capillary hemangioendothelioma, but microscopic study of the excised vaginal tumor revealed an atypical metastasis of a malignant hypernephroma. There were no renal symptoms or a palpable renal tumor. The diagnosis of malignant hypernephroma of the kidney was established on the basis of the vaginal biopsy. Since the 10th thoracic vertebra had already been destroyed by a metastasis, removal of the primary tumor seemed useless. Metastases invaded the lungs and liver, and the woman died 10 weeks after admission to the clinic. Autopsy revealed that the primary tumor was located in the left kidney.

The author reviews 50 cases from the literature in which vaginal and vulvar metastases had resulted from a hypernephroma. He stresses the following points: 1. Vaginal or vulvar metastases of hypernephroma are probably more frequent than is generally assumed. 2. They are characteristically located near the introitus vaginae, and the distal third of the anterior vaginal wall around the urethral opening is primarily involved. 3. Gynecologic symptoms caused by the metastasis are often the primary manifestation. 4. The histological examination is of particular importance, because it frequently gives the first indication of the primary renal tumor which causes no, or only slight, symptoms. 5. It may prove difficult to differentiate the growth from a vascularized sarcoma or from an angioblastic sarcoma. 6. Metastases develop in the vagina and vulva mainly when the renal tumor is on the left side, and this is explained by a retrograde venous dissemination. 7. Effective treatment is possible only if the metastases of the hypernephroma are still restricted to the vagina or vulva; it consists of nephrectomy and extirpation of the metastases followed by roentgen-ray or radium irradiation.

Fetal Salvage in Rh Incompatability Where Previous Stillbirths Have Occurred. W. D. Bowman. Minnesota Med. 41:386-389 (June) 1958 [St. Paul].

The author states that all fetal deaths from Rh sensitization occur after the 28th week—most of them after the 34th week of pregnancy. The presence of a viable fetus in utero at 30 to 35 weeks has led to the conclusion that induction or cesarean section sufficiently early to produce living premature infants might lead to the salvage of some of these infants. At term the possibility of a living infant is remote where the father is homozygous Rh-positive and there have been previous fetal hydropic or stillborn infants due to Rh incompatability. Thirteen cases of pregnancy in 12 women who had previously delivered at least 1 fetal hydropic or stillborn child due to Rh sensitization are presented. Induction at 36 weeks in 1 case in which the husband was heterozygous was too late, and an infant with fetal hydrops resulted. The husbands of the remaining patients were homozygous Rh-positive. Induction or cesarean section was performed at or before 35 weeks, and all the apparently normal infants survived after adequate exchange transfusion. In an effort to prevent even the first case of fetal hydrops, labor has been induced for the past 2 years at 34 to 36 weeks in all women showing a 4-fold rise in albumin antibody titer in the third trimester. Delivery at or before 35 weeks, followed by prompt and, if necessary, repeated exchange transfusions, will save the lives of more than 80% of infants with hemolytic disease of the newborn, when the mother has had 1 or more previous stillborn infants due to Rh sensitization.

PEDIATRICS

Aseptic Meningitis in Manitoba, 1957. J. C. Wilt, H. Medovy, D. Besant and W. Stackiw. Canad. M. A. J. 78:839-842 (June 1) 1958 [Toronto].

Fourteen boys and 6 girls with aseptic meningitis were admitted to the Winnepeg Children's Hospital between July and September, 1957. Three of the 20 patients were infants, aged less than 1 year, and 2 of these had convulsions in the course of their illness. The duration of illness was from 5 to 10 days in 13 children; 1 patient had a shorter course, and 6 had a more prolonged course. All the patients had fever, and nearly all had headache and a stiff neck. Vomiting occurred in 10 patients. The spinal fluid showed a pleocytosis of 20 to 300 cells per cubic millimeter in 15 patients. The protein level in the spinal fluid was not markedly elevated, varying from zero to 40 mg. per 100 cc. in 12 patients. The glucose content was normal. The illness was not too severe except for the infants. Fever and headache subsided in a few days, and there were no sequelae. Laboratory studies revealed virus infections in 12 of the 20 patients. The disease was due to enteric cytopathogenic human orphan (ECHO) virus, type 6, in 8 children, to Coxsackie virus, group A, in 2, to ECHO virus, type 9, in 1, and to an unidentified virus in 1. Seventeen cases of aseptic meningitis outside the Children's Hospital were also identified as virus infections: poliomyelitis virus was found in 5 patients; ECHO virus, type 6, in 5; ECHO virus, type 9, in 4; Coxsackie virus, group B, in 1; Coxsackie virus, group A, in 1; and an unidentified virus in 1. Since the reporting of benign encephalitis is not too reliable, it is impossible to determine the total number of infections of this type which occurred in the outbreak of aseptic meningitis in the province of Manitoba in the summer of 1957. It is probable that the 20 patients admitted to the Winnipeg Children's Hospital represent most of the severest infections which in former years would have been classified as nonparalytic poliomyelitis.

Unexplained Death from Exchange Transfusion. W. C. Taylor, L. C. Grisdale and A. G. Stewart. J. Pediat. 52:694-700 (June) 1958 [St. Louis].

The authors report on 2 infants with hemolytic disease of the newborn, who died suddenly and unexpectedly during or shortly after exchange transfusions which they received for their disease. Electrocardiograms were obtained from both patients before, in the course of, and after the transfusions. In one patient bradycardia, ventricular fibrillation, and cardiac arrest occurred after the exchange of 70 cc. of blood. In the other patient bradycardia and arrhythmia occurred after an exchange of 185 cc. of blood. The cases of these 2 infants were compared with 8 other cases collected from the literature in which there was a similarity of clinical or electrocardiographic findings. From the data available it is not possible to state that any one specific factor or combination of factors is responsible for the occurrence of cardiac arrest in infants undergoing exchange transfusion. According to circumstances several or all of the following factors may be present: hyperpotassemia, hypocalcemia, cooling of the heart, acidosis, prematurity, and the disease process of hemolytic disease. There may be other factors at present unsuspected. The combined use of electrocardiography and adequate biochemical study is one way of further elucidating the problems involved and, at the same time, ensuring maximum safety for the infant.

Hepatodiaphragmatic Interposition of Jejunum, Ileum, Cecum and Ascending Colon with Intestinal Obstruction: Report of a Case Corrected Surgically. D. W. Aiken. New England J. Med. 258:1192-1195 (June 12) 1958 [Boston].

Interposition of intestine between liver and diaphragm has been called Chilaiditi's syndrome. It is known almost exclusively as a roentgenologic diagnosis, involving the colon far more often than the small intestine, and is usually an unsuspected, incidental, asymptomatic finding. It occurred in approximately 1 of every 1,000 abdominal roentgenograms in 1 series. The case of the 14-month-old boy presented in this paper is unusual in several respects. Search of the world's medical literature revealed no case of interposition of virtually the entire jejunum and ileum and none in which the small intestine entered the suprahepatic spaces at the liver's posterior border. This case also represents a type of internal hernia not previously included in standard classifications of internal hernias. An associated vestigial remnant of an abnormal or variant fetal umbilical circulation is of additional interest.

The patient was a mentally retarded infant who was hospitalized because of intermittent vomiting. The preoperative diagnosis was high intestinal obstruction, probably incomplete. The mother said that the infant always struggled and cried excessively before each bowel movement, sometimes with the appearance of a "knot" in the upper abdomen. The stomach at laparotomy was partially decompressed, whereas the duodenum was dilated with fluid. From the ligament of Treitz, a dilated, fluid-filled, tense jejunum coursed directly to the right side of the abdomen, to the posterior border of the right lobe of the liver in the "lumbar gutter" and thence disappeared behind the liver. The obstruction was nearly complete. Beside the limb of jejunum, a normal transverse colon emerged from behind (and lateral to) the liver. The ascending colon, cecum, appendix, and entire small intestine below the first 6 to 8 cm. of jejunum were interposed between the liver and the right leaf of the diaphragm. Gentle traction on the small intestine resulted in gradual return of the displaced organs to their infrahepatic position. The intestine was largely collapsed and contained small amounts of gas and fluid. As the ileum came into view, so did a string-like cord containing 2 vessels resembling veins. This structure, which had been stretched upward behind the liver, was bluish black at first, but regained viable color and blood flow in a few minutes. It was found to connect the right lateral umbilical ligament ("obliterated hypogastric artery") at the pelvic brim with a retroperitoneal vessel, probably the superior mesenteric vein, at the right side of the superior end of the jejunal mesentery. The specimen removed was a cylindrical piece of fatty and fibrous-appearing tissue, 7.2 cm. long and 0.2 to 0.4 cm. in diameter. The area of attachment of the liver to the diaphragm was small.

The aberrant vestigial vessels crossing the abdominal cavity may have been an etiological factor in bringing about the interposition. The stretched, tense vessels were lying predominantly above the posterior border of the liver with the entrapped intestine. Persisting vascular connections between the umbilical vessels and the superior mesenteric vein are remnants, in part, of the vitelline circulation. The cause of this infant's mental retardation has not been fully investigated. The vestigial vessels could have served as a shunt in the fetus, bypassing the placenta and interfering with proper oxygenation during critical phases of cerebral development.

Idiopathic Pulmonary Hemosiderosis. J. Espinoza, E. Simpfendorfer and J. Hasbun. Rev. chilena pediat. 29:20-33 (Jan.) 1958 (In Spanish) [Santiago, Chile].

Idiopathic pulmonary hemosiderosis is rare. The disease is supposed to be due to hypersplenism which interferes with the elasticity of the pulmonary vascular system diminishes the resistance of the blood vessels, and exposes them to trauma. The disease has its inception during the first few months of life. It follows a more or less rapid course. Survival of the patients from the appearance of first symptoms has varied from 5 weeks to 3 years. In 1952, 4 cases were reported in the literature. The patients were subjected to a splenectomy, with survival and good health up to the present for more than 6 years after the operation. The disease appears suddenly with intense pallor, moderate fever, fatigue, great weakness and diminished respiration. Shortly afterward there appear tachycardia, cyanosis, and dyspnea. The disease runs its course with remissions and aggravations. The lungs on auscultation seem to be normal, whereas the roentgen-ray examination of the chest shows characteristic shadows of hemosiderosis, consisting of diminished transparency of pulmonary fields and a network pattern covering the pulmonary fields up to the periphery. The roentgen-ray picture of pulmonary hemosiderosis is entirely different from that of either miliary tuberculosis or sarcoidosis. The sputum contains epithelial cells and phagocytes filled with hemosiderin. The pulmonary tissue obtained by puncture biopsy is positive to the iron-pigment test. The treatment seems to consist of a splenectomy.

The subject of this report was an infant, 9 months old, in an apparently normal state of health. The patient suddenly became ill, refused food, and constantly moaned. She was hospitalized 12 hours after the appearance of symptoms of weakness, intense pallor, moderate fever, cyanosis, and dyspnea. She exhibited anemia, marked tachycardia, and overloading of the right heart. The lungs on auscultation appeared normal. Roentgen-ray examination of the chest showed characteristic changes of pulmonary hemosiderosis. A transfusion of 150 cc. was given. The patient showed an immediate favorable reaction which continued for 5 days. On the 6th day of hospitalization, however, she developed cyanosis and dyspnea and died. The autopsy showed acute pulmonary lesions of hemosiderosis, infiltration, and interstitial fibrosis of the lungs. The liver and particularly the spleen were the seat of an acute hyperplastic reaction of the reticuloendothelial cells. Death was caused by acute anemia and overloading of the right heart. The autopsy seemed to confirm the theory that the disease is one of hypersplenism and that the treatment should be that of a splenectomy.

Escherichia Coli Enteritis. V. G. Balaban. Pediatriya 36:10-16 (May) 1958 (In Russian) [Moscow].

The author describes the clinical and bacteriological features of enteritis due to Escherichia coli. The typical features of this type of intestinal disease are the severity and persistence of anhydremia, severity of toxicosis (occasionally without vomiting), seasonal occurrence during autumn and winter, and extraordinary contagiousness. The etiological role of the Escherichia organisms has been proved by the presence of an epidemic chain, by the isolation of Esch. coli of a serologic type during life, and by the culture of these organisms from the deceased, as well as by an antigenic culture which is identical with the Esch. coli O111:B4 strain. This has been confirmed in cross reactions of agglutinations and adsorption of agglutinins. The pathogenic properties have been demonstrated in animal experiments. These studies establish the existence of a special group of acute intestinal diseases in early childhood and the etiological role of Esch. coli O111:B4 in these diseases.

Diagnosis of Nephrolithiasis in Children. L. A. Diligenskaya and N. G. Dementeva. Pediatriya 36:72-77 (May) 1958 (In Russian) [Moscow].

Thirteen instances of nephrolithiasis were observed between 1951 and 1955, inclusive, at the First Moscow Medical Institute in children who ranged in age from 1 year and 4 month to 9½ years. There were 7 boys and 6 girls. The duration of clinical symptoms was from 1 month to 3½ years. The authors point out that, although nephrolithiasis is frequent in children, it is not always diagnosed. The clinical picture in children lacks the usual characteristic symptoms. Chronic pyuria is the most common symptom. Nephrolithiasis is diagnosed by roentgenologic examination; therefore, all children with chronic pyuria should undergo x-ray study. Besides the usual roentgenograms, pyelography should be performed. X-ray examination in children is not difficult, is well tolerated, and can be carried out in any children's hospital.

Duration of Persistence of Diaplacentally Transmitted Poliomyelitis Antibodies in Infants. F. Müller and H. Lennartz. Deutsche med. Wchnschr. 83: 966-968 (May 30) 1958 (In German) [Stuttgart, Germany].

It is important to know how long the neutralizing poliomyelitis antibodies which are transmitted from mother to child remain present in a measurable titer, because this indicates the duration of the diaplacentally acquired immunity to poliomyelitis. The authors examined the serums of 182 infants, ranging in age from 1 to 12 months, for the presence of neutralizing antibodies to the 3 types of poliomyelitis virus. During the first 2 months of life all infants had neutralizing poliomyelitis antibodies against at least 1 type of virus; namely 94% against type 1 and 88% against type 2 or type 3. Antibodies against all 3 types of virus were present in 76%, against 2 types in 17%, and against only 1 type in 7% of the infants. The percentage of infants who had neutralizing poliomyelitis antibodies decreased with advancing age, reaching the lowest point between the 9th and the 11th month. Beginning with the 12th month, there was a renewed increase in the percentage of antibody carriers. Most children lose antibodies against 1 or 2 types of viruses during the first 4 months, but they retain a residual immunity with 1 or 2 types of antibodies. The authors are unable to make conclusive statements about which of the 3 antibodies disappears first, but they feel that there are no essential differences. The duration of the persistence of the diaplacentally acquired antibodies seems to depend less on the type of virus than on the height of the titer. Only toward the end of the first year of life there begins a serologically measurable and demonstrable reaction to the different types of poliomyelitis virus.

It has been suggested that young infants could be protected against paralytic poliomyelitis by the oral administration of an attenuated living virus. Investigators associated with Koprowski and with Sabin demonstrated that even infants without diaplacentally acquired neutralizing poliomyelitis antibodies respond during the early months of life to the oral administration of virus with a high antibody titer without showing signs of illness. This method of active immunization with a living, attenuated virus has the great advantage of doing away with repeated vaccinations. The booster effect is produced by natural contact with the types of poliomyelitis virus during the subsequent years. The authors believe that oral immunization with living attenuated virus has been carried out on too few children without neutralizing antibodies to permit the conclusion that paralytic forms of poliomyelitis will not occur. This risk could be obviated by employing this type of oral immunization during the first 2 months of life, that is, under the protection of the neutralizing poliomyelitis antibodies that the infant acquires from the mother.

Escherichia Coli Enteritis in Nurslings. I. V. Tsimbler, T. S. Sokolova and T. A. Khomitskaya. Pediatriya 36:3-10 (May) 1958 (In Russian) [Moscow].

The authors report on 204 children admitted to the Institute of Pediatrics of the U. S. S. R. Academy of Medical Sciences with a diagnosis of enteritis. In 50% of the cases the enteritis was due to pathogenic strains of Escherichia coli (Esch. coli O111:B4, Esch. coli O55, and Esch. coli O26) and was severest in infections with Esch. coli O111:B4. The pathogenic strains of the Escherichia organisms make this disease contagious and can lead to its spread in an epidemic chain. Children weakened by previous disease and inadequate care and those with parenteral foci of infection are most susceptible to the pathogenic strains. In these children the infection is manifested by an acute, toxic disease of the intestines. The course of the infection is milder in older children, but they may become carriers. The treatment of this type of infection includes antibiotics, cardiac stimulants, and intravenous infusion of saline solutions.

Megacolon and Its Treatment in Children. S. Ya. Doletski. Vestnik khir. 80:91-98 (May) 1958 (In Russian) [Leningrad].

The author reports on 42 children with megacolon treated between 1951 and 1957 at the Second Moscow Medical Institute. The ages of the children varied from 1 month to 14 years. There were 26 boys and 16 girls. Sixteen patients were operated on; the rest were treated conservatively. Histological studies demonstrated that megacolon in a child is always associated with a lack of parasympathetic ganglions in Auerbach's plexus of the large intestine. The clinical manifestation of the predominance of the tonicity of the sympathetic plexus over the incompletely developed parasympathetic is a continuous spasm of the rectosigmoidal segment. The dilatation of the large intestine is the consequence of its advancing decompensation in its struggle to overcome the resistance of the distal constriction zone. Medical treatment must be applied with the aim of giving the neuromuscular centers of the large intestine time to adjust their function to the state of abnormal innervation. Resection of the rectosigmoidal segment should be done if the medical treatment fails. The dilated portion of the large intestine is to be left alone.

UROLOGY

Genitourinary Focus in Rheumatic Disorder in the Male. B. Domeij, G. Giertz, B. Olhagen and R. Romanus. Acta chir. scandinav. 115:1-10 (No. 1-2) 1958 (In English) [Stockholm].

Clinical observations long ago suggested a relationship between certain urologic diseases and rheumatic disorders. The authors point to the Fiessinger and Leroy syndrome of nonspecific urethritis, polyarthritis, and conjunctivitis in the French literature and show that in the literature of other countries, particularly the Anglo-American, Reiter's name has been coupled with this syndrome. In the department of surgery and the urologic unit of Karolinska Sjukhuset in Stockholm, a relationship between urologic disorders and pelvospondylitis ossificans had been established by Romanus in 1953. The problem was studied in the department of rheumatology from 1954 onward. At first, patients with verified cases of pelvospondylitis were chiefly examined urologically, but once it was found that a large number of patients with polyarthritis and with only peripheral joint manifestations had histories of genitourinary disorders clearly linked in time with the onset of the condition a more systematic collaboration started with the urologic unit. For more than 12 months the urologists of this team (Giertz and Romanus) held a weekly conference with their colleagues of the department of rheumatology in order to examine and follow up practically all male patients admitted to the latter department, a total of 190. Both urologists, as a rule, examined each patient, and the results were later compared.

The urologic examination included palpation of the prostate and seminal vesicles, as well as cytological and bacteriological examination of the material expressed from these glands. The rheumatologic diagnoses were pelvospondylitis ossificans (ankylosing spondylitis), rheumatoid arthritis, and "postinfectious polyarthritis" (Reiter syndrome, postgonorrheal arthritis, rheumatic fever) among others. A control series of 66 men, without rheumatic disorders but of corresponding ages, was also examined. Chronic inflammatory changes of the prostate and seminal vesicles, with or without signs of activity, were demonstrated in one-third of the control group, in more than one-half of the patients with rheumatoid arthritis, in 85% of those with postinfectious polyarthritis, and in 97% of the 73 patients with pelvospondylitis. About two-thirds of the patients in the latter group had a history of genitourinary disorder. The possible etiological significance of these observations is discussed.

Cancer of the Penis: A Clinical Study of 229 Cases.

T. Ekström and F. Edsmyr. Acta chir. scandinav. 115:25-45 (No. 1-2) 1958 (In English) [Stockholm].

The aim of this study was to evaluate the results of the treatment of penile cancer employed in Sweden from 1920 to 1955. The records of 229 patients with histologically verified cancer of the penis were analyzed. Of these, 194 were treated before 1952 and were followed up for at least 5 years or until death. All were regularly examined at intervals of 2 to 6 month. The mean age of the patients was slightly more than 60 years. The youngest patient was 23 years old, and the oldest 84. Phimosis was present in about half of the patients. Treatment of the primary tumor consisted of amputation of the penis. Only in relatively few patients was local excision or radiotherapy alone employed. Inguinal node dissection was performed only when spread was suspected, either in association with treatment of the primary tumor or later. In the remaining cases the inguinal regions were irradiated with telegamma in fractionated dosage. The frequency of metastatic spread was correlated with various factors of possible importance. The patient's age and the site and histological differentiation of the tumor appeared to be important in this respect. The duration of symptoms, on the other hand, apparently was without significance for spread. The size of the primary tumor likewise failed to affect the frequency of spread. Only patients treated before 1952 were considered in the prognostic evaluation. Patients with at least 5 years of metastasis-free survival were classed as cured. Prognostic evaluation was considered impossible in patients who died of other disease within 5 years and displayed no signs of metastases.

Of the 112 patients in the "metastases-free" group, 101 (90%) were cured; the corresponding figures for the 55 patients in whom inguinal metastases were removed were 21 (38%); for the 65 with metastases the cure rate was 21 (32%); in the total series of 177 patients, 122 (69%) were cured. The grade of malignancy of the primary tumor seemed to influence the prognosis principally by the greater incidence of metastatic spread in tumors of low differentiation. Preputial cancer seemed to be more "benign" than other forms of penile cancer; metastases occurred less often. Although the frequency of inguinal spread was higher in the younger patients, the prognosis in this group was not definitely poorer than in the rest of the series.

Amputation of the penis 2 cm. below the tumor implies radical removal of the latter. If the primary tumor is so large that amputation would result in a very short or no penile stump, total extirpation of the penis and perineal urethrostomy should be performed. Local recurrence after amputation occurred in 9 patients with advanced cancer in whom this requirement was not fulfilled. Local excision appears to be justified when the cancer is confined to the prepuce. It does not seem adequate for small superficial tumors of the glans. Irradiation of the primary tumor may be itself produce cure in selected cases. The results do not indicate the advisability of routine dissection of lymph nodes. This presupposes regular follow-up. In younger patients (less than 40 years), however, it is possible that lymph node dissection should be performed, as metastases are common in such patients. Suspected inguinal metastases at the time of amputation or occurring later should be extirpated. If the suspicion is confirmed, the contralateral groin should be dissected. When inguinal nodes are not removed simultaneously with penile amputation, the malignancy of the primary tumor provides some guidance in doubtful cases. The risk of surgical complications seems to be less when inguinal dissection is performed in a later stage, after the septic adenitis has subsided.

Foreign Bodies in the Kidney: A Case of a Needle Within the Calyces. J. Naulleau and S. Sakka. Presse méd. 66:705-707 (April 23) 1958 (In French) [Paris].

Remnants of a needle, which was probably swallowed in childhood, were responsible for subcostal pain on the left side in a 21-year-old patient. The trouble apparently began at the age of 9 years when he had subcostal pain radiating to the left side of the lumbar region and around the umbilicus. The attacks of pain were precipitated by physical effort, but sometimes occurred without apparent reason during the day or in the course of the night when they were severe enough to awaken the patient. These intermittent painful phenomena were the only functional troubles; there were no digestive signs, except occasional abdominal distention, and no urinary disorders. Several erroneous diagnoses were made, but the foreign bodies remained unrecognized for 18 years, during which the attacks of pain became increasingly severe and frequent. The patient, who had been forced to restrict his activities and whose disposition was being adversely affected, eventually consulted the authors. Only one sign was found on clinical examination: percussion of the left side of the lumbar region provoked pain projected forward into the left-sided hypochondrium; this resembled the patient's spontaneous pain in its topography and characteristics and suggested either a pancreatic or a left renal lesion. Roentgenograms revealed 2 metallic fragments suggesting a broken needle. Calcareous incrustations surrounded the fragments. Intravenous urography established the intrarenal location of these foreign bodies and showed that they were lodged in the lower calyces which were greatly dilated. At operation one of the fragments and the concretions surrounding it were removed through a pyelotomy incision. Nephrotomy, however, was required for removal of the second fragment which was larger and more deeply embedded in the lower calyces. Convalescence was uneventful; the patient was completely free from his former pain and was able to return to work. A control urography 2 months after operation showed that the dilation of the calyces had disappeared; it provided a disagreeable surprise, however, by revealing a third extremely small (1 mm.) metallic fragment that had been overlooked at operation. Reexamination of the preoperative films then led to the discovery of a previously unnoticed detail—the longer fragment was composed of 2 sections, the smaller and innermost of which had been left behind. A second roentgenogram made during the operation, after removal of the first 2 metallic fragments, would have revealed the presence of the third, which may in time become the center of a new calculus.

OPHTHALMOLOGY

Acetazolamide (Diamox) Therapy in Chronic Glaucoma: A Three-Year Follow-Up Study. C. A. de Carvalho, C. Lawrence and H. H. Stone. A. M. A. Arch. Ophth. 59:840-849 (June) 1958 [Chicago].

Acetazolamide (Diamox) became available as an additional therapeutic agent for the management of glaucoma in 1954, but the mechanism of action of this drug as well as its exact locus of action still remains to be demonstrated. Since carbonic anhydrase is known to be present in lens epithelium, ciliary body, and retina, 2 problems present themselves: 1. Does long-term administration of acetazolamide interfere with the metabolic processes of ocular tissues? 2. Will the prolonged administration of acetazolamide irreversibly suppress the process of aqueous formation, i. e., produce a "biochemical cyclodiathermy"? The patients on whom the authors made their studies were drawn from the general glaucoma clinic of the Wilmer Institute, Johns Hopkins University, Baltimore, and were studied in the Diamox research clinic. The present study covers the period from October, 1953, to February, 1957. The majority of the patients studied had had 1 or more filtering operations with subsequent uncontrolled tensions prior to their admission to the Diamox research clinic; the others had had no previous surgery, but their tensions could not be controlled on maximal medical therapy, and they were therefore referred to the Diamox research clinic. All the patients in this series were on maintenance therapy with pilocarpine, 2% to 7%, and 0.25% physostigmine 5 times daily in addition to ointment at bedtime, and some patients were also given 0.1% isoflurophate once daily. In addition, they received an average dose of 1 Gm. of acetazolamide a day, given in divided doses of 250 mg. 4 times a day. Follow-up visits occurred at 6-to-8-week intervals.

Of 24 patients with chronic open-angle glaucoma, uncontrolled by maximal medical therapy, 21 had controlled intraocular pressures over a 3-year period of acetazolamide and miotic therapy. The average reduction in pressure was 12mm. Hg, and the lowered pressure was primarily due to a reduction of aqueous flow (average 60%) as measured by tonography. The over-all percentage of failures in this series of clinic patients was 13% to 21%; 6 of 28 eyes revealed progressive visual field loss in spite of controlled intraocular pressure. The exact site and mode of action of acetazolamide still remain to be established, but there is no evidence that long-term acetazolamide therapy irreversibly suppresses the formation of aqueous humor. After discontinuation of long-term acetazolamide therapy, the intraocular pressure rose to essentially pretherapy levels. The longest follow-up of continuous acetazolamide therapy in this series was 38 months. Acetazolamide appears to be a relatively safe drug. No significant ocular complications occurred. Vision and visual fields were maintained in many eyes in which the prognosis would have been poor without the addition of acetazolamide therapy. Until longer follow-up studies are available, it is advisable to defer the use of long-term acetazolamide therapy until the various local therapeutic agents have proved inadequate. It should then be used as an adjunct to other therapeutic measures and not as a substitute. It cannot be overemphasized that this study deals solely with chronic simple glaucoma. Except during the immediate preoperative period, acetazolamide therapy has no place in the management of acute, congestive, or closed-angle glaucoma.

Hereditary Optic Atrophy. H. A. Iverson. A. M. A. Arch. Ophth. 59:850-853 (June) 1958 [Chicago].

Congenital hereditary optic atrophy is a rare but important specific entity, which is seldom recognized. It is distinct from Leber's hereditary optic atrophy, particularly as to its age of onset, course, relative absence of associated physical abnormalities, and pattern of hereditary transmission. In the majority of the cases described in the literature, there is moderate pallor of both optic disks with sufficient atrophy so that the cribiform plates are well made out. There is moderate to severe loss of vision. The optic atrophy is thought to be present at birth. Hereditary optic atrophy affects both sexes, and it may be transmitted to successive generations through either the male or the female. A young boy and a young girl were brought under observation because of poor vision. The family history of these 2 children, who were siblings, indicated further visual difficulties in the family. Five persons showing moderately severe optic atrophy were found in 4 generations consisting of 18 persons. Another person, now deceased, can be presumed to have had the same condition. A further patient showed a mild disease of the optic disks. Fourteen of the 18 members of the family came under examination. The condition appears to be congenital, and it is transmitted as a dominant trait.

Uveitis Caused by Helminths and Protoza. J. F. Kessel. A. M. A. Arch. Ophth. 59:854-860 (June) 1958 [Chicago].

It has been recognized for many years in Africa and in certain areas of Central and South America that microfilariae of Onchocerca volvulus produce blindness. Insect larvae have frequently been found to cause ocular myiasis. Additional reports involving the relationship of other animal parasitic infections to uveitis have been presented within the last few years. Ocular infection with any living agent of disease, whether virus, bacterium, fungus, or animal parasite, should be looked upon merely as an incident during the general infection of man by that parasite. The author summarizes earlier knowledge on uveitis caused by helminths and protozoa and reviews the recent reports. Both helminths and protozoa have been found in the uveal tract in man. The helminths are all developmental forms and are represented by (1) microfilariae of Onchocerca and possibly Wuchereria and (2) migrating larvae of other nematodes. The latter most probably occur as an incident to visceral larva migrans, which is caused most frequently by Toxocara canis.

Regarding protozoa as etiological agents of choroidal injury, the author says that recent studies indicate that trypanosomiasis alone is rarely associated with keratitis or choroiditis. Toxoplasma gondii has been definitely shown to be responsible for chorioretinitis of man. This may occur in toxoplasmosis of either the congenital or the postnatal type. With regard to Entamoeba histolytica, the author says that certain cases of central serous choroidosis occurring in association with amebiasis have been found to respond to standard amebic therapy. Either a direct invasion by E. histolytica into the tissues or a hypersensitization in the absence of amebas in the macular lesion is suggested.

Newer Concepts in Treatment of Metastatic Ocular Carcinoma. R. Buxeda. Bol. Asoc. méd. Puerto Rico 50:154-158 (April) 1958 (In English) [Santurce].

Metastatic carcinoma of the eye is the most common secondary tumor of the inner eye. The left eye is more frequently affected than the right. Bilateralization is a common occurrence. The site of the primary tumor, in order of frequency, is the female breast, the lung, the alimentary tract, the thyroid, and the liver. The prostate, the ovary and the parotid gland give rise to eye metastases in very rare instances. The tumor is more frequent in women than in men, and in women between the ages of 40 and 50 years. Ocular metastases of carcinoma appear early during the development of the primary tumor. The symptoms of the ocular metastases appear several months before those of the primary tumor in many cases. The posterior region of the choroid is the most frequently involved portion of the eye, especially its temporal side near the macula. The ophthalmoscopic appearance of choroidal metastatic carcinoma is typical. The swelling appears as a thickening of the choroid with a shallow retinal detachment at the anterior choroidal pole. The tumor develops rapidly. Acute pain appears early and frequently involves the necessity of enucleation. The span of life after the appearance of acute symptoms varies between 4 weeks and 8 months and, in rare cases, 2 years. Cachexia and multiple metastases in many organs of the body develop rapidly. Up to the present time the treatment was considered as palliative. Of late, it has been found that the span of the patient's life can be prolonged and the eyesight improved by means of properly selected hormone therapy or by means of gynecologic operations or neurosurgery aimed at eliminating all sources of hormones that favor the growth of the metastases. Hormone therapy or surgical operations give satisfactory results, according to the literature, when the primary tumor is hormone-dependent.

Dietary Treatment of Myopia in Children. P. A. Gardiner. Lancet 1:1152-1155 (May 31) 1958 [London].

Myopic children, in general, grow more irregularly and mature earlier than their fellows. The rate of visual deterioration coincides in both time and degree with spurts of physical growth. Increase in myopia is greater and commoner in children who refuse animal protein in their diet than in those whose tastes are more catholic. A nutritional problem has been exposed, in that myopic children whose eyes are deteriorating eat less food for every pound they increase in weight than do normally sighted children and those myopes whose eyes are not deteriorating. The food element most noticeably implicated is animal protein. The present investigation, of which this is a preliminary report, was based on the possibility that rectification of the apparent imbalance of growth and nutrition might diminish the deterioration in eyesight which is seen in most myopic children.

In a group of short-sighted children who attended the research clinic at Guy's Hospital, London, and received extra animal protein, the rate of visual deterioration was much less than in a group who attended the ordinary school ophthalmic clinic and whose diet was not changed. The difference in treatment between the 2 groups lay primarily in the increased amount of animal protein consumed by the treated group, though it is clear that other factors were at work. With a few exceptions among the younger children, those who carried out the treatment most assiduously tended to deteriorate more slowly than their more casual fellows. Of the children over 12 years of age, there was actual improvement in most of those who took the greatest quantity of animal protein. Whatever may be the cause of acquired myopia in children and adolescents, its course can be beneficially modified by dietary means. The factors involved still need elucidation.

THERAPEUTICS

A New Concept in the Treatment of Penicillin Reactions: Use of Penicillinase. R. M. Becker. Ann. Int. Med. 48:1228-1242 (June) 1958 [Lancaster, Pa.].

This report is concerned with the clinical effectiveness of penicillinase in humans with penicillin reactions. Penicillinase is an enzyme specific for its substrate penicillin. It can be obtained from several strains of bacteria, including staphylococci and Escherichia coli. Commercially it is produced in greatest abundance from cultures of Bacillus cereus, strain NRRL-B 569. The inactivating action of penicillinase is through its catalytic hydrolysis of the lactam ring of the penicillin molecule, changing penicillin to penicilloic acid, which is nonantigenic in this sensitivity system. In an earlier study it was found that in guinea pigs and in humans who had received penicillin, and in whom consistent penicillin blood levels were established, no circulating penicillin could be found within an hour or less after a parenteral injection of penicillinase. No toxic effects from penicillinase were noted.

Forty-six patients with penicillin reactions were treated with penicillinase. Twenty-four of these patients were treated with intramuscular injections of penicillinase alone, with uniformly good results. The other 22 patients had previously received or were given concomitantly various antihistamines and/or corticotropin and steroids. In 20 of these patients the favorable clinical response seemed to be directly attributable to the penicillinase. In the 2 cases with a poor response, the penicillinase was given weeks to months after the reaction started. In 1 case that could be classified as only a fair response, the penicillinase was given 2 weeks after the onset of the reaction. No systemic toxic reactions to single or multiple injections of penicillinase were noted. A few patients complained of pain at the site of injection, and 1 patient had a local reaction with induration which may or may not have been due to the enzyme. Penicillinase should prove to be an extremely valuable adjuvant therapy in the treatment of penicillin reactions.

Use of Radioactive Iodine in the Treatment of Angina Pectoris. R. L. Segal, S. Silver, S. B. Yohalem and R. A. Newburger. Am. J. Cardiol. 1:671-681 (June) 1958 [New York].

The authors report on 65 euthyroid patients, 46 men and 19 women, between the ages of 34 and 74 years, with intractable angina pectoris, who were given a tracer dose of radioactive iodine (I^{131}) and in whom the uptake by the thyroid gland was measured at 24 hours by the usual method. Most of them had an uptake of less than 55% at 24 hours. The patients were then given a therapeutic dose of I^{131}. After 8 to 12 weeks the clinical results were evaluated. If adequate clinical response had occurred or complete myxedema was present, no further therapy with I^{131} was practiced. If there was an unsatisfactory clinical response and myxedema was not present, a second therapeutic dose was administered. A similar routine was followed at 3-month intervals until either a clinical response had occurred or myxedema was present and had been confirmed by appropriate laboratory studies.

Of the 65 patients, 15 (about 25%) who received an average dose of 24 mc. of I^{131} and who retained 12.5 mc. obtained excellent results, being essentially free of anginal pain and able to assume a reasonably normal life. Twenty-three patients who received an average dose of 34.2 mc. of I^{131} and who retained 9 mc. obtained good results, with a significant reduction in the frequency and severity of the anginal attacks; angina decubitus, if present before the institution of radioactive iodine therapy, was completely relieved. Nine patients who received an average dose of 33 mc. of I^{131} and who retained 13 mc. obtained fair results, with some lessening of the frequency and severity of anginal attacks but with impairment of activity still present. Ten patients who received an average dose of 32 mc. of I^{131} and who retained 10 mc. were therapeutic failures. Eight patients died within 3 months of therapy, 5 of the 8 died within 1 month of therapy, and in 3 of these there was an exacerbation of cardiac symptoms possibly secondary to an acute irradiation thyroiditis. The reaction of severe acute irradiation thyroiditis occurred only in those patients who received a retained dose of more than 12 mc. as the initial dose. Generalized side-effects were primarily those due to the induction of myxedema, consisting of sluggish mental functioning and muscle cramps, cold skin, tendency to fatigue, and general lassitude. In addition to myxedema there were the inevitable side-effects of general body irradiation.

In patients with intractable angina pectoris, the induction of myxedema or a hypothyroid state by ablation of the thyroid gland with I^{131} is of definite value for producing symptomatic relief. The indication for treatment is severe intractable angina pectoris of relative stability which has been resistant to standard cardiac therapy. The contraindications are preexisting hypothyroidism and recent coronary artery occlusion. Symptoms of myxedema can be partially controlled by the administration of small doses of thyroid extract, without reactivating the anginal pain. Acute irradiation thyroiditis may cause transient hyperthyroidism, and this may be a contributory cause of death after therapy. Adjustment of time-dose relationship may prevent this reaction. It is recommended that the first series of treatment should be given in 2 or 3 fractional doses at weekly intervals; the first dose should be selected so that not more than 7 mc. is retained by the normal-sized thyroid gland.

Effect of 6-Mercaptopurine in 41 Cases of Acute Leukemia in the Adult. Y. Kenis, T. Peltzer and H. J. Tagnon. Rev. hémat. 13:132-147 (April-June) 1958 (In French) [Paris].

Thirty adult patients with acute leukemia were treated with mercaptopurine. One complete remission, 6 partial remissions, and 3 clinical remissions were secured. The depressive effect of mercaptopurine on the leukocytes was observed in almost all the patients. Nine other patients with chronic myeloid leukemia undergoing transformation to acute leukemia were also treated with mercaptopurine. Only 2 partial remissions were obtained in these patients. No improvement was seen in 2 patients with chronic lymphoid leukemia who were treated with mercaptopurine during periods of acute lymphoblastic exacerbation.

The effect of mercaptopurine on the blast cells and on the leukocytes is often rapid, but clinical improvement, when it occurs, does not appear until 3 weeks at the earliest after the start of the treatment, and complete remission does not become evident until after 3 months of treatment. Administration of the drug should therefore be continued until the leukemic cells have disappeared completely from the bone marrow or until definite medullary hypoplasia becomes evident.

Clinical Comparison of 6 Digitalis Preparations by the Parenteral Route. C. Aravanis and A. A. Luisada. Am. J. Cardiol. 1:706-716 (June) 1958 [New York].

The authors report on 162 patients, between the ages of 21 and 90 years, 138 of whom had heart failure, the remaining 24 were patients of the average age of 65 years without heart failure who served as controls. The 162 patients were divided into 6 groups of 27 each, and a different commercial preparation of digitalis was given to each group. These preparations were digitoxin (Digitaline Nativelle), digoxin (Lanoxin), deacetyl-lanatocide C (Cedilanid D), gitalin (Gitaligin), a complex of glycosides (Ouabain), and acetyl-digitoxin alpha (Acylanid). The drugs were administered by intravenous injections as a rule, and some patients were given intramuscular injections. Full digitalization was obtained within 2 to 4 days with comparable doses. Clinical data, venous pressure and circulation time, roentgenologic and electrocardiographic data were noted for 7 days. The rating of the preparations used was based on the following criteria: reduction of pulse at the end of treatment, rapidity of improvement, changes in venous pressure and circulation time, reduction in size of the heart, electrocardiographic changes, and toxic manifestations. The following doses were considered average total doses for intravenous digitalization: digitoxin, 1.2 to 1.4 mg.; acetyl-digitoxin, 1.04 to 1.6 mg.; digoxin, 2 to 2.2 mg.; Cedilanid D, 2 to 2.2 mg.;

gitalin, 4 to 5 mg.; and Ouabain, 0.50 to 0.75 mg. These total doses were ascertained by subtracting the average daily eliminated dose from the total dose received.

The greatest effect on heart rate was obtained with digoxin and Cedilanid. The greatest rapidity of effect was obtained with Ouabain followed by digitoxin. The greatest decrease of signs of congestion was obtained with digitoxin, acetyl-digitoxin, or digoxin. The greatest decrease of cardiac size was obtained with digitoxin or acetyl-digitoxin. This does not confirm previous studies of the authors, according to which Ouabain would exert a greater action than the above-mentioned glycosides. The greatest changes in the electrocardiogram were exerted by digitoxin; the smallest, by Cedilanid. This was considered as a point in favor of the latter. The greatest toxicity was found with digoxin, while digitoxin did not seem to present special problems. Gitalin seems to have an intermediate position from the various points of view. The over-all rating of the glycosides is discussed. This, however, should not be unduly stressed, as special indications were found for several glycosides.

PATHOLOGY

The Healing of Myocardial Infarction. M. D. Zaikin. Klin. med. 39:103-110 (May) 1958 (In Russian) [Moscow].

The author reports on a postmortem study of the hearts of 50 patients who died as the result of a myocardial infarction. The majority in this group were patients, 50 to 70 years old. Severe atherosclerosis of the coronary arteries with narrowing of the lumen was found in 40 patients; 9 hearts presented a moderate degree of atherosclerosis of the coronary arteries; and 1 patient had normal coronary arteries. Coronary thrombosis was found in 22 cases only. These were cases with advanced atherosclerosis of the coronaries. The author distinguishes 2 types of infarction: (1) infarcts, in the absence of thrombosis of the coronary branches, which are the result of a prolonged spasm manifested morphologically as small necrotic foci involving exclusively muscle fibers; (2) infarcts which are the results of thrombosis of 1 of the large branches of the coronary system, with extensive involvement of the myocardium characterized by necrosis of both muscle fibers and interstitial tissues with blood vessels. The healing of the small myocardial infarcts takes from 5 to 6 weeks. Complete healing of extensive myocardial infarction takes place at various periods of 2½ to 4 months. The healing time required depends upon the age of the patient, the extent of necrosis, the degree of atherosclerosis of the coronary arteries, and the functional state of the myocardium.

The Histologic Patterns of Ruptured Myocardial Infarcts. W. J. Freeman. A. M. A. Arch. Path. 65:646-653 (June) 1958 [Chicago].

Rupture of the myocardium may be caused by trauma, infection, or neoplastic disease, but by far the commonest single cause is myocardial infarction due to arteriosclerosis of the coronary arteries. Every case of acute myocardial infarction is a potential case of rupture. The mechanisms leading to rupture are only partly understood, and so the significance of clinical events cannot be properly evaluated. This study of the histology of ruptured infarcts, based on material from the autopsy files of the Grace-New Haven (Conn.) Community Hospital from 1925 to 1954, was undertaken with the aim of determining such mechanisms. Attention was drawn to certain general factors, which either increase the rupturing force (e. g., hypertension, lack of adequate bed rest) or decrease the ability of the ventricular wall to resist the force (e. g., age, general debility, myocardial atrophy). There were 38 ruptures in 484 patients with myocardial infarcts. Two of the 38 cases were disregarded as not germane to the problem: one, a case of rupture of the interventricular septum with survival of the patient for almost a year, and the other, a case of dissecting hemorrhage from a fibrotic aneurysm of the left ventricle.

The remaining 36 cases were arranged in the order of the time interval between clinical diagnosis of infarction and death. The commonest intervals between clinically apparent infarction and death were less than 24 hours and from 3 to 7 days. Histological examination of the hearts demonstrated multiple superimposed infarcts, the commonest pattern being that of a multiple subendocardial infarct of an indicated age of 3 to 7 days, surrounded by a very recent transmural infarct, associated with a single occlusive thrombus in a major coronary artery. Indirect evidence indicated that the older, smaller infarct was caused by partial obstruction of the major vessel at the site of eventual thrombosis. The hypothesis is proposed that rupture is most likely to occur when an ischemic infarct is followed in 3 to 7 days by coronary thrombosis and a superimposed transmural infarct.

Amyloidosis of the Heart. R. M. Mulligan. A. M. A. Arch. Path. 65:615-630 (June) 1958 [Chicago].

In a study of the causes of death of 1,150 persons, 70 years of age and older, autopsied at the Colorado General Hospital, Denver, between July 1, 1940, and July 1, 1955, the 17 cases of amyloidosis of the heart observed in 16 men and 1 woman constituted 1.5% of the total. Since the ratio of men to women among these 1,150 persons was 2.5:1, the corrected ratio for amyloidosis of the heart was 6.4:1. Fifteen patients were 80 to 89 years of age, and the remaining 2 were 72 and 77. Amyloidosis of the heart was the cause of death in 7 patients and was a contributing cause in the other 10 patients. Symptoms and signs of cardiac failure not responding readily to treatment were common. The chest roentgenograph revealed variable heart size, pulmonary edema, and hydrothorax. Important findings in the electrocardiogram were low voltage of ventricular complex, low amplitude of atrial complex, delayed intraventricular conduction, and partial atrioventricular block. Amyloid, appearing most frequently as gross granules in the atrial endocardium and as granules or diffuse infiltrations of the myocardium of all chambers, was less common in the epicardium and valves. The hearts affected ranged from normal size to striking hypertrophy. Coronary arteriosclerosis was usually minimal to moderate and nonocclusive.

The amyloid, deposited in the myocardium, predominantly among the muscle fibers and the capillaries, was metachromatic with methyl violet or crystal violet, variably red with Congo red, and a distinctive shade with ammoniacal silver. The apparent common denominators of amyloidosis of the heart were senility and malnutrition. In this connection the author comments on (1) weight loss, anemia, poor dentition, and atrophy of the liver; (2) restricted intake, impaired absorption, and faulty utilization of food; (3) progressive decline of blood albumin, rise of blood globulin, and fall of thiamine with age in both sexes; and (4) progressive decline of blood ascorbic acid with age in men. Amyloidosis, regardless of localization, is properly thought of as secondary on the basis of a disturbance of blood proteins, in which hyperglobulinemia is paramount. Other factors as yet unappreciated may also be operative. Study of the blood proteins by electrophoresis and an accurate mapping of amyloid in the heart in relation to the conduction system are desirable in future investigations of amyloidosis of the heart.

Pseudoneoplastic Changes of the Vesical Mucosa After Radium Therapy for Cervical Carcinoma.

P. Natale, R. Grattarola and E. Mattea. Minerva ginec. 10:229-232 (March 31) 1958 (In Italian) [Turin, Italy].

Radio therapy for cervical carcinoma may produce tissue changes of the vesical mucosa which on cytological and histological examinations simulate neoplastic lesions. These tissue changes may sometimes appear several years after discontinuance of radio therapy. Since they regress spontaneously, surgical therapy is not indicated and might even be harmful.

The authors report on 2 patients who had received radio therapy for cervical carcinoma of type 2. One woman at the age of 64 years was given radio therapy which produced complete remission of the tumor. Two years after discontinuance of the treatment, the patient complained of macroscopic terminal hematuria accompanied by mild stranguria and no pyuria. At a gynecologic examination the cervix uteri was normal and there was no infiltration into the parametrium. At cystoscopic examination part of the bladder mucosa was covered with lentil-size protuberances, which were red in color and were a source of easy bleeding. The surrounding mucosa was pale in color with a few spots of telangiectasia. Endoscopic examination indicated the presence of a vesical tumor, and bioptic examination showed a bladder carcinoma. No surgical operation was performed because some doubts still persisted about the existence of cancer. Seven months later the bladder was found free of the new growth. The other woman was operated on for mammary carcinoma at the age of 27 and was given a course of radio therapy for cervical carcinoma when she was 37 years of age. She complained of macroscopic terminal hematuria accompanied by mild stranguria 5 years after discontinuance of radio therapy. Cystoscopic and endoscopic examinations indicated the presence of small carcinoma nests on the bladder mucosa but no invasion of the parametrium. No surgery was performed. Retrogression of the new growth on the bladder mucosa was established on endoscopic examination 18 months later.

Cytomegalic-Inclusion Disease in the Adult.

E. R. Fisher and E. Davis. New England J. Med. 258: 1036-1040 (May 22) 1958 [Boston].

The occurrence of cytomegaly with intranuclear inclusions is well recognized in newborn and older infants, but it is less widely known that a similar cytopathological alteration may be present in adults. A review of the literature revealed 17 cases, and it appears significant that almost all the patients, except those in whom cytomegaly was limited to the epithelium of gastrointestinal ulcers, had a debilitating disease, such as septicemia, blood dyscrasia or other hematological disorder, malignant lymphoma, or pneumonitis due to Pneumocystis carinii. The authors describe the clinical and pathological findings in 2 adults with cytomelagy with intranuclear inclusions. This cellular change was present in the lungs, liver, lymph nodes, adrenal cortex, and bone marrow in one patient, who had myelogenous leukemia, but was confined to the lungs in the other. A fibrosing interstitial pneumonitis apparently due to the cytomegalic infection was present in both. This relation appears worthy of note, since pneumonitis in previous examples of adult cytomegaly has been attributed to associated infection with P. carinii or other causative agents.

The Pneumocystis organisms were not identified in the lungs of the 2 patients, despite a careful search of many sections with various staining techniques considered to facilitate their identification. The lungs appeared congested and hemorrhagic rather than the characteristic gray of pneumocystis pneumonitis. The interstitial fibrosis and lymphocytic infiltrate, hyaline membranes, Masson bodies, alveolar epithelization, and lack of significant bronchiolar or alveolar inflammatory infiltrate are reminiscent of the morphologic appearance of the changes encountered in fibrosing interstitial pneumonitis. The viral nature of this type has been suspected but not conclusively demonstrated. The histochemical characterization of the intranuclear inclusions as desoxyribonucleoprotein is compatible with the interpretation that these structures represent viral aggregates. However, it appears equally tenable that they represent altered nuclear substance and not viral particles per se. The pathogenesis of cytomegalic-inclusion disease in adults has not been conclusively demonstrated. Its occurrence in persons with debilitating diseases, particularly those in whom antimetabolite, steroid, or antibiotic therapy has been utilized, has prompted an analogy between cytomegalic infection and the not infrequent mycotic infections noted in such patients. It is of interest in this regard that candida organisms as well as cytomegalic inclusions were present in 1 of the patients. The predilection of cytomegalic-inclusion disease for adults with disorders of the reticuloendothelial system or those receiving therapy that may affect the activity of this system suggests that alteration of the immune mechanism may allow for reactivation of a latent infection or facilitate exogenous invasion. Further viral and immunological investigations appear essential to clarify the pathogenesis of cytomegalic-inclusion disease in the adult.

Researches on Toxoplasmosis in Uruguay: Survival of Toxoplasma Gondii in Human Blood "in Vitro." R. V. Talice, J. Gurri, J. Royol and L. Pérez-Moreira. An. Fac. med. Montevideo 42:143-147 (Sept.-Dec.) 1957 (In Spanish) [Montevideo, Uruguay].

Parasitemia has been verified in the acute phase of diffuse toxoplasmosis in man. In the last months of pregnancy this condition has been regarded as the causal factor of congenital toxoplasmosis. There is danger of accidental transmission of toxoplasmosis from man to man by blood transfusions. Experiments have shown that Toxoplasma gondii survives for a certain number of days in the organs of infected animals stored in a refrigerator or in the peritoneal exudates preserved in capillary tubes. The authors performed experiments with white mice to determine the period of survival and the infectivity of T. gondii in human blood stored in a refrigerator. Blood used for transfusions was obtained from the Bank of Blood and Plasma at the Faculty of Medicine of Montevideo. White mice daily received intraperitoneal injections of a mixture of human blood and peritoneal exudates of mice previously inoculated with the RH strain of T. gondii. A daily dose of 0.5 cc. of the human blood–toxoplasmatic exudate mixture, containing 1,700, 1,875, and 6,400 Toxoplasma organisms, respectively, was given for 5, 8, and 30 days, and the mixture was preserved all that time in the refrigerator at 5 C. Then the injections were given at intervals of 5 or 8 days up to the 50th or 57th day. Whether the animals died spontaneously or were killed at the end of the experiments, the peritoneal exudates obtained on autopsy proved to contain a large number of Toxoplasma organisms up to the 50th day of preservation of the blood. The inoculation of blood preserved up to 57 days did not produce these organisms in the peritoneal exudates.

The authors conclude that Toxoplasma organisms in citrated human blood stored at 5 C, when injected intraperitoneally into white mice, may remain alive and infective to the animals for at least 50 days. This period of survival of the protozoans is much longer than that found in organs of infected animals preserved in the refrigerator or in the exudate of an infected animal placed in capillary tubes. The virulence of the strain in the mouse does not decline over the above period. In the human blood–toxoplasmatic exudate mixture, extracellular Toxoplasma organisms are visible in smears. The survival of these organisms in preserved blood demonstrates the danger of accidental transmission of toxoplasmosis in blood transfusions. It would be interesting to study the in vitro action of active drugs upon T. gondii in the infecting blood–exudate mixture so as to be utilized, as a preventive measure, in transfusions of blood from donors with positive toxoplasmatic reactions (Sabin and Feldman's intradermal reaction). The survival of Toxoplasma organisms in blood may constitute a convenient practical method of preserving strains in the laboratory. The question remains as to which blood components are relevant in the in vitro preservation of T. gondii.

RADIOLOGY

Treatment of Lung Cancer (Primary and Metastatic) by Radioactive Phosphorus Administered Intravenously, Intra-Arterially and Intracardially. I. M. Ariel. Am. J. Roentgenol. 79:961-980 (June) 1958 [Springfield, Ill.].

This study was undertaken to investigate a method of administering irradiation to patients with inoperable lung cancer without subjecting them to the rigors of external irradiation or thoracotomy. Internal irradiation with radioactive phosphorus (P^{32}) was chosen for this purpose. This report describes: (1) the effects of P^{32} upon the alleviation of symptoms of patients bearing pulmonary cancer, either primary or metastatic; (2) the effect of this therapy upon longevity; (3) a measurement designed to show whether there is a collective uptake of the isotope by the tumor in excess of that of normal pulmonary tissue; and (4) attempts to enhance the concentration of the isotope by (*a*) injecting the isotope directly into the heart, thereby possibly avoiding some of the dilution which may occur, (*b*) noting the effect of a preliminary course of nitrogen mustard upon the selective uptake of the isotope by the tumor, and (*c*) noting the effect of administering P^{32} intra-arterially. Data on 51 patients were tabulated.

Radiophosphorus (P^{32}) did not increase the life span in patients with pulmonary neoplasm, either primary or metastatic. An alleviation of troublesome symptoms due to the lung cancer occurred in a significant number of patients treated with an average dose of 10 mc. of P^{32}. Measurements of the concentration of P^{32} in various regions of the chest cavity (including the lung tumor) revealed a significant pick-up of the isotope by the tumor in most instances. It was not possible, by the techniques used, to determine accurately the differential pick-up ratio with other segments of the lungs. The pick-up of P^{32} by the neoplasm and the normal lung tissues varied at different time intervals after the initial injection. The cause and significance of these fluctuations remain enigmatic. Primary lung tumors and neoplasms metastatic from primary breast cancer apparently responded best to the intravenous administration of P^{32}. Metastases from primary neoplasm of the uterus, ovaries, rectum, and colon did not respond to this form of therapy. Attempts to enhance the concentration of P^{32} in pulmonary neoplasms by administering the isotope intracardially, intra-arterially, or subsequent to a course of nitrogen mustard were unsuccessful. No serious untoward reactions occurred in this series of patients as the result of P^{32} therapy. Hematopoietic depression was usually slight. The intravenous administration of P^{32} produces a definite but limited relief of troublesome symptoms due to pulmonary cancer.

Interstitial Implantation in the Treatment of Primary Bronchogenic Carcinoma. U. K. Henschke. Am. J. Roentgenol. 79:981-987 (June) 1958 [Springfield, Ill.].

In a review of the literature the author ascertained that in 900 of 2,075 patients with primary bronchogenic carcinoma, operated on with the intent of carrying out a resection, the tumor was found to be too far advanced for excision. At the present, the chest is then closed in most hospitals. The author advocates the use of interstitial implantation of radioactive sources, as it is carried out at the Memorial Center in New York. He reviews observations on 119 patients with primary carcinoma of the lung, treated from 1941 to 1955, on whom interstitial implantation was carried out at thoracotomy, but no resection was performed. These cases are a relatively uniform group, since they include no early cases (these would have been resected at thoracotomy) and no late cases (these would not have been explored). Supplementary external radiation therapy was used in most cases in this 1941-1955 group in contrast to the group of patients, treated in 1956 and 1957, on whom external irradiation was used only occasionally. It was felt that the results in the patients treated with interstitial implantation at thoracotomy up to the end of 1955 were encouraging. Attempts, therefore, were made to improve interstitial implantation at thoracotomy by better techniques and by the use of artificial radioisotopes.

The author describes a new implantation technique that has been used since the beginning of 1956 with radon as well as with radioactive iridium sources. The advantages of this technique over older methods of implantation are enumerated. In the search for a more suitable radioactive source for permanent implantation, many artificial radioisotopes have been evaluated, such as radioactive gold (Au^{198}), iridium (Ir^{192}), tantalum (Ta^{182}), chromium (Cr^{51}), and mercury (Hg^{203}), but only Au^{198} and Ir^{192} were found worthwhile for clinical trials. The gamma radiation from Au^{198} and Ir^{192} is energetic enough to avoid increased absorption in the bone. The dose rate for these 2 artificial radioisotopes up to a distance of 6 cm. in tissue is the same as that with radon. Important in the practical use of Au^{198} and Ir^{192} is the lower half-value in lead. This makes adequate protection for Au^{198} and Ir^{192} possible with relatively small lead containers. The lower maximum beta energy of Au^{198} and Ir^{192} permits the use of thinner shields around the sources to filter out the beta particles. This, in combination with the high cross section of the iridium to neutron capture, has made it possible to produce Ir^{192} sources which have a much smaller diameter than radon or Au^{198} seeds.

These and other advantages of Ir^{192} prompted its clinical use in a greater percentage of patients. Whereas in 1956, out of 47 implants, 6 were done with Ir^{192}; in 1957 Ir^{192} sources were used in 31 of 34 implants. The remaining implants were done with radon. While more work is necessary to establish the value and place of interstitial therapy in the treatment of lung cancer, experience so far suggests the following preliminary conclusions: 1. A much higher tumor dose can be delivered with less damage to normal tissues by interstitial implantation at the time of thoracotomy than by external radiation therapy. 2. Interstitial implantation at thoracotomy can be done with little risk and in most cases can substitute for a subsequent course of external radiation therapy. 3. Results of interstitial implantation in lung tumors are encouraging, especially in superior sulcus tumors. 4. Accuracy of interstitial implantation can be greatly improved by a technique in which unloaded hollow needles are placed in and around the tumor prior to the introduction of the radioactive sources. 5. Ir^{192} appears to be a promising radioisotope for permanent interstitial implantation.

Coronary Insufficiency Associated with Oral Administration of Gall-Bladder Dye. D. Littman and F. I. Marcus. New England J. Med. 285:1248-1250 (June 19) 1958 [Boston].

Four instances of fatal coronary accidents occurring in close proximity to the oral ingestion of gallbladder dye are reported. In every instance coronary pain was noted for the first time or had recurred 10 to 30 days prior to the test being performed. Should a causal relationship exist between the time of oral ingestion of the gallbladder dye and the advent of myocardial infarction or coronary occlusion, the mechanism of acute coronary insufficiency is unknown, although a vasovagal reflex is postulated. The recent development or recurrence of symptoms of coronary insufficiency implies either a new occlusion or myocardial infarction or both. The fragility of such patients and their proneness to subsequent additional coronary mishaps are sufficiently well recognized to serve as a deterrent to elective surgery or various other diagnostic procedures. Under these circumstances cholecystography may well be a hazardous procedure and should not be performed without positive indications. Premedication with atropine is suggested as a reasonable prophylactic measure should it be necessary to accomplish this procedure.

Malignant Melanoma: A Combined Surgical and Radiotherapeutic Approach. R. J. Dickson, Am. J. Roentgenol. 79:1063-1070 (June) 1958 [Springfield, Ill.].

Neither surgery nor radiation therapy alone will cure a majority of patients with malignant melanoma. The object of this study was to evaluate the efficacy of postoperative irradiation, as advocated by the late Dr. G. E. Richards, of Toronto General Hospital. All case histories in the tumor registry of that hospital were examined, so that patients who had not been treated in this fashion were available for comparison of end-results. The records of the radiotherapy department of Johns Hopkins Hospital and of the tumor registry of the Public Health Service Hospital in Baltimore were examined. No case of prepuberal melanoma was included in the series, for it is well known that the clinical course of a prepuberal lesion may be entirely benign. Secondly, melanoma of the uveal tract was excluded, for this condition appears to run a more chronic course than melanoma of the skin. The total number of case histories finally available was 254, consisting of 188 from the Toronto General Hospital and 66 from the 2 hospitals in Baltimore. These patients had been followed to death, for at least 5 years if still alive, or until lost to further follow-up examination.

A 5-year survival rate of 41% was achieved in a series of 121 patients with malignant melanoma treated by surgery and postoperative irradiation, or by palliative irradiation therapy. Approximately one-quarter of the patients treated by excisional surgery without irradiation survived the corresponding period, and those whose treatment consisted of local therapy without more aggressive treatment within 1 month showed a slightly worse prognosis, only about 20% being alive at the end of 5 years. Surgical treatment in stage 1 and stage 2 consisted usually of a wide excision of the primary growth and of the immediate lymph-drainage areas. Irradiation was delivered to all areas found to contain disease. The author believes that the opinion that irradiation therapy is valueless in this disease is based on experience with inadequate dosage. The survival rates reported are higher than those of other series treated by surgery alone. It is suggested that postoperative irradiation in association with wide excisional surgery is an adequate alternative to ablative and deforming operations.

The Angiographic Evaluation of Cerebral Arteriosclerosis. M. Tatelman. Radiology 70:801-810 (June) 1958 [Syracuse, N. Y.].

The author reports on angiographic studies obtained in a series of 200 consecutive patients admitted to the Detroit Memorial Hospital with the clinical diagnosis of "stroke" or a cerebrovascular accident. Each case was studied by carotid or vertebral angiography or both. Complete occlusion of the internal carotid artery, usually immediately above the origin of the internal carotid artery, accounted for 10.5% of the cases. Demonstration of adequate filling of the external carotid branches obviated the need for repeat injections to test the validity of the nonfilling internal carotid artery. Occlusion of the middle cerebral artery occurred in 9 of the 200 patients. Most of the occlusions were close to the origin of the artery, although some were seen somewhat distal to the origin. The frequency of nonfilling of 1 anterior cerebral artery was 7.5%, the block occurring in most instances exactly at the origin of the artery. The fact that the involved anterior cerebral artery will fill by collateral flow through the anterior communicating artery suggests that such findings merely represent some variation in vascular dynamics or a congenital narrowing or absence of the anterior cerebral artery.

Atherosclerosis is postulated as causing either complete occlusion of the vessel or narrowing of its lumen to the point where blood flow is insufficient to allow it to be filled by contrast injection. The following findings are offered to support this contention: 1. All the patients in this series had symptoms of some cerebral abnormality which could not be explained by any other finding. 2. In almost every case characteristic convulsive movements and syncope were produced by digital compression of the contralateral carotid artery. 3. In some cases where pneumoencephalography was done, there was definite evidence of localized atrophy of the frontal lobe on the side on which the anterior cerebral artery failed to fill. 4. The involved anterior cerebral artery could never be filled on repeated injections. 5. Padget has indicated that significant variations in the size of the anterior cerebral artery are uncommon and that such small cerebral arteries are found much more frequently in the older age groups than in the young.

Occlusion of the vertebral-basilar artery system accounted for 5 of the 200 "stroke" cases. Partial occlusion of the internal carotid artery was found in 10% (20) of the patients. The narrowing produced by the atherosclerotic plaque is almost always seen distal to the origin of the internal carotid artery and may show an eccentric filling defect in the lumen, most often with a broad base, but sometimes having an appearance simulating a flap valve, or less often as a symmetrical narrowing of the vessel. The latter findings are important in that a few of these patients have returned months later with complete occlusion of the internal carotid artery at the site of the atheromatous plaque. Minor changes of arteriosclerosis in the cerebral vessels are similar to those found in arteries elsewhere in the body.

A Review of the Current Status of Nonoperative Cholecystoangiography. E. M. Cohn and D. M. Sklaroff. A. M. A. Arch. Int. Med. 101:1051-1056 (June) 1958 [Chicago].

Several years ago a striking advance in roentgenologic examination enabling the common duct to be visualized was made possible by the intravenous administration of iodipamide (Cholografin) methylglucamine, which is a colorless solution of the bis N-methylglucamine salt of 3-3'-(adipoyldiimino) bis (2,4,6-triiodobenzoic acid). Shortly thereafter it was learned that the biliary tract could be outlined in the absence of the gallbladder. This latter maneuver is an outstanding advantage in the attempt to determine whether symptoms which persist after cholecystectomy are associated with ductal disease. Furthermore, the intravenous administration of iodipamide eliminates the variable factor of intestinal absorption, circumvents the interference imposed by pyloric obstruction, overcomes the difficulty encountered in some persons who cannot swallow tablets, and is capable of demonstrating the patency of the sphincter of Oddi by its presence in the small intestine. There are, however, several disadvantages, namely, inconvenience of intravenous administration, higher basic cost of the examination, stratification between the radiopaque medium and the nonopaque bile, inability of the gallbladder to show varying degrees of shadow density and/or diminution in size, and the regurgitation of the roentgenographic medium into the duodenal bulb simulating a gallbladder in a patient who has supposedly undergone cholecystectomy.

In the somewhat limited study of 114 patients who had undergone a cholecystectomy and on whom intravenous choliangiography had been performed, a positive or confirmatory diagnosis was made in 54 (47%), was essential in making the diagnosis in 18 (15%), failed to visualize the biliary tract in 17 (14%), was of equivocal value in 17 (14%), and proved to be erroneous in 8 (7%). If statistics were to be compiled eliminating patients with jaundice or recognized liver damage, the accuracy of useful choliangiography has been reported to be on the order of 86%. Iodipamide is to be preferred when patients are unable to swallow tablets, in small intestinal disease with interference in obstruction, in pyloric obstruction, and in emergencies when speed is a factor of importance.

The Value of Radiotherapy in Inoperable Bronchogenic Carcinoma. K. Sicher. Practitioner 180:695-700 (June) 1958 [London].

Of 347 patients with inoperable bronchogenic carcinoma, 200 were treated by radiotherapy, and an attempt was made to compare their progress with that of 147 patients who received no therapy. The majority of the patients were treated by simple methods, but, nevertheless, it was observed that the symptomatic relief was more or less the same as in those who were treated by elaborate techniques. In each group about 70% of the patients obtained either very good or good symptomatic results, but the percentage of objective improvements was higher among those treated with elaborate techniques and a higher dose, and those patients also had a better survival rate. Of 23 patients who survived a year or more, 16 were treated to a dose higher than 4000 r. The difference in survival time between treated and untreated patients is appreciable and is statistically significant not only in the immediate response (i. e., within 3 to 12 months) but also in the long run (2 or 3 years after completion of treatment). As most of the patients were in an advanced stage of the disease, a survival rate of 4.5% for 3 years is not to be ignored. Those who survived longer after treatment also enjoyed good symptomatic relief, and therefore life was really worthwhile prolonging.

Since this survey was completed, the following policy has been adopted at the radiotherapy center with which the author is connected. Every patient with bronchogenic malignant neoplasm not suitable for surgery is given the benefit of radiotherapy, unless the expectation of life is thought to be less than 1 month. Even in some of those unfortunate patients, a short course of deep x-ray therapy is of help if severe respiratory symptoms are present, particularly if the pathology of the tumor suggests a radiosensitive growth. In a patient in whom the immediate prognosis is not so alarming, a fairly simple method of therapy is used with the intention of delivering a tumor dose of up to 3000 to 4000 r. This can usually be achieved without producing any appreciable local skin and general systemic reactions. In patients in whom a single lymph node is involved, the treatment of the primary lesion should be extended also to the secondary deposit. In the presence of pleural effusion, aspiration of the fluid must be performed, and a course of antibiotics should never be omitted if there is any associated infective element. In more favorable cases in which the general condition is satisfactory, a course of therapy is indicated, irrespective of whether severe symptoms are present. A dose of 5000 r or more produces most survivals, and to achieve this dose, employment of time-consuming and elaborate methods is justified.

PUBLIC HEALTH

Mass Prophylaxis of Epidemic Streptococcal Infections with Benzathine Penicillin G: Experience at a Naval Training Center During the Winter of 1955-56. A. J. Schreier, V. E. Hockett and J. R. Sea. New England J. Med. **258**:1231-1238 (June 19) 1958 [Boston].

In the interval between Nov. 21, 1955, and April 14, 1956, a single intramuscular injection of 600,000 units of benzathine penicillin was given to 19,561 newly arrived recruits at a naval training center in an effort to minimize epidemic streptococcic infections and rheumatic fever. The program was successful in reducing the incidence of streptococcic infections by the contrast with previous winters when prophylaxis was not used or was used only after outbreaks had occurred. The program did not prevent outbreaks among recruits who were on duty at the station prior to the institution of the prophylaxis program, in later weeks, among those recruits who received prophylaxis on arrival, or among those recruits who departed from the duty station still harboring virulent strains of group A streptococci acquired during their training. On a man-days-risk basis the incidence of rheumatic fever was 3 times higher among recruits trained before and after prophylaxis than among those receiving prophylaxis, despite the fact that the program was conducted during the months in which rheumatic fever is usually most frequent.

The single 600,000-unit dose of benzathine penicillin was adjudged as affording the individual a high degree of individual protection against streptococcic infection for a period of 3½ weeks even under adverse conditions. A total of 145 clinical episodes were recorded in which recruits sought medical attention for sensitivity-like reactions after being given prophylactic benzathine penicillin. The latter rate of 0.74% compares favorably with the 0.86% incidence reported in a smaller previous study at the station, although it is approximately twice that observed after mass oral penicillin prophylaxis. The ratio of serum-sickness reactions was again higher than that observed with oral prophylaxis. There were no serious reactions, the majority of the sensitivity reactions being mild and transitory in nature and responding readily to antihistamines given in an ambulatory status.

Relationship of Measles and Distemper. J. A. Adams, D. T. Imagawa, D. L. Chadwick and others. A. M. A. J. Dis. Child. **95**:601-608 (June) 1958 [Chicago].

Although measles and distemper must be considered as distinct clinical entities, there are certain clear-cut relationships between the two, as both are characterized by a high degree of contagiousness, are caused by viruses, and have almost identical incubation periods in their respective natural hosts, man and dog. The striking symptoms in both diseases are respiratory, consisting of cough, coryza, fever, and conjuctivitis. Demyelinating encephalitis occurs in both in a small proportion of cases. However, the most striking similarities are seen in the pathological and immunological findings. The measles virus has been shown to multiply readily in most human cell cultures and has been adapted to suckling mice. The canine distemper strain of virus, which has been successfully adapted to the chick embryo and mice, causes disease primarily in the Canidae family (dog) and the Mustelidae family comprised of the mink, ferret, and marten.

The human pathological material was obtained from 2 patients who died of infection by measles virus. In the first patient who died of interstitial pneumonia after having measles, the microscopic study revealed a mononuclear-cell infiltration with fibrosis of the interstitial tissue. The alveolar epithelium was swollen, and large proliferating giant cells were present containing nuclear as well as cytoplasmic inclusions. In the second patient, the most striking finding was the occurrence of large multinucleated cells, many of which contained as many as 50 to 60 nuclei. The alveoli were filled with large mononuclear cells with reticular nuclei. The cytoplasm of the alveoli and the bronchial lining cells contained eosinophilic inclusion bodies measuring 1 to 5 μ. The most outstanding finding in canine distemper is the presence of cytoplasmic and nuclear inclusion bodies in lung sections as well as in urinary sediments and in bladder sections. Inclusion bodies appeared as early as the 9th day after inoculation and were encountered primarily in intestinal, pharyngeal, tracheal, lung, and bladder sections. Proliferative changes with giant-cell formation were evident 13 days after inoculation. Interstitial pneumonia, with peribronchial involvement made up of infiltrated mononuclear cells and destruction of lining epithelium, was a prominent finding.

The typical cytopathogenesis produced by measles virus in HeLa-cell cultures has been neutralized by both measles and distemper antiserums produced in ferrets, although the preimmunization or normal ferret serum did not inhibit the measles virus. In the 3 experiments in which ferrets were immunized with measles virus and, subsequently, challenged with distemper virus, some evidence of protection was evident as revealed by prolonged incubation periods and modified illnesses with survival. Neutralization of the mouse-adapted distemper virus by specific measles antiserums was clearly demonstrated when mice, into which there were injected 300 LD_{50} of mouse-adapted distemper virus and undiluted measles antiserum mixtures, were completely protected against the lethal effects of the virus. Preimmunization and ferret control serum afforded no protection. Similar protection was evident with antiserum produced by mouse-adapted and egg-adapted distemper virus, suggesting that common antigenic components are shared by the viruses of measles and distemper.

Community Trials of BCG Vaccination. C. E. Palmer, L. W. Shaw and G. W. Comstock. Am. Rev. Tuberc. 77:877-907 (June) 1958 [New York].

This paper is a progress report, intended to summarize the results of the community trials with BCG vaccination in Puerto Rico and in two southern counties during the first 6 or 7 years of follow-up observation. The trials were conducted by the Public Health Service. In Puerto Rico, an area where tuberculosis has been a serious problem for many years, BCG vaccinations were given to children from 1 to 18 years of age. In Muscogee County, Georgia, and Russell County, Alabama, where the tuberculosis problem is similar to that found in many other communities in this country, BCG was given to persons more than 5 years of age. More than a quarter of a million persons were placed under study: 112,000 tuberculin reactors and 144,000 nonreactors, who were allocated by a randomization scheme to vaccinated and control (unvaccinated) groups. For the identification of new cases of tuberculosis, the established medical, public health, and vital statistics reporting systems were chosen as being sufficient and also as being more likely to yield unbiased information than periodic examinations. Both trials demonstrated that the risk of developing tuberculosis was much greater for persons who were tuberculin reactors than for those who were nonreactors. Of the total number of cases that appeared during the follow-up period, 75% were among reactors; consequently, only the 25% of the cases that would have appeared among the initial nonreactors could have been prevented if vaccination had been completely effective. Tuberculosis case rates among nonreactors were low. In Puerto Rico the rate was 43 per 100,000 per year among controls and 30 among those vaccinated. In the Muscogee-Russell trial the corresponding rates were 22 among controls and 14 among the vaccinated.

The low case rates among nonreactors can be attributed to the present low risk of acquiring new infections. Evidence of low and falling infection rates in this country is found both in the present trials and in other recent studies. Because BCG cannot help those who are already infected, or those who will not become infected, and may be helpful only to a portion of the decreasing few who will become infected in the future, it is apparent that vaccination cannot be very useful in controlling tuberculosis in this country. Moreover, with the rapid decline in tuberculous infection, the tuberculin test is becoming increasingly more valuable for epidemiologic, case-finding, and diagnostic purposes. These uses of the tuberculin test are destroyed by vaccination, which makes it virtually impossible to identify the naturally infected persons; and, as those who are already infected are now the group at greatest risk, it is upon them that tuberculosis control activities should be focused if the disease is to be eradicated. The position is taken that in most situations in this country today the advantages of BCG vaccination are outweighed by the disadvantages.

BOOK REVIEWS

Auscultation of the Heart. By Abe Ravin, M.D., Associate Clinical Professor of Medicine, University of Colorado School of Medicine, Denver. Cloth. $6. Pp. 166, with 45 illustrations. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1958.

The correlation of auscultatory findings with information obtained by graphic techniques, by cardiac catheterization, and by the cardiac surgeon has produced a major revolution in the physical diagnosis of heart disease. The contributions of British cardiologists, in particular, have been notable. This remarkable little volume provides a concise, highly readable résumé of virtually all of the significant advances in such knowledge. It will spare the hard-pressed student or practitioner many library hours poring over original source material, although an excellent bibliography is provided for those so disposed. Many will find the simple graphic illustrations accompanying the text of value in achieving visual imagery of auscultatory phenomena. The value of the book is, however, appreciably diminished by the absence of a section devoted to the bedside diagnosis of arrhythmias. As in any such book, there are a number of statements which would be seriously challenged by others proficient in the field. To list but a few examples: 1. The author considers decrease in the intensity of the first heart sound strictly a function of the P-R interval and denies the role of myocardial weakness as an etiologic factor. 2. It is stated that relative mitral insufficiency may result from "improper closure of the mitral valve because of the absence of auricular contraction, as in auricular fibrillation." 3. A remarkable feat of anatomy is postulated by the author on page 70 when he suggests that the murmur of mitral insufficiency may be heard maximally above and medial to the apex when left auricular enlargement extends "anteriorly to the chest wall." This little volume, combining a lucid, unembellished style with a wealth of information, should prove to be a valuable acquisition for students and physicians alike who are interested in achieving a high level of skill in the clinical examination of the heart.

Atlas de technique opératoire chirurgie de la main. Par Marc Iselin, Luc Gosse, Serge Boussard et Daniel Benoist. Cloth. Pp. 336, with 692 illustrations. Editions médicales Flammarion, 22, rue de Vaugirard, Paris 6e, France, 1958.

This atlas presents a complete and up-to-date exposition of the surgery of the hand. Part 1 deals with the anatomy and the physiology of the hand; part 2 with closed injuries; part 3 with fresh injuries; part 4 with reparative plastic procedures, including a chapter on the treatment of severed nerves and on palliative treatment of the various paralyses of the hand; part 5 with acute infections, chronic synovitis, and Dupuytren's contracture; and part 6 with congenital anomalies of the hand and their treatment. The value of the atlas is enhanced by the profuse and excellent pen and ink illustrations by Jean Dudouet. The legends are brief and adequate. This atlas should prove a valuable contribution to an important subject.

The Practice of Infectious Disease. By Louis Weinstein, Ph.D., M.D., Professor of Medicine, Tufts University School of Medicine, Boston. Handbooks for general practitioner [series]. Cloth. $8.50. Pp. 501. Landsberger Medical Books, Inc., distributed by Blakiston Division, McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36; 95 Farringdon St., London, E. C. 4, England, 1958.

The author has written a comprehensive but somewhat disappointing book. He has assembled a series of brief discussions of a wide variety of infectious entities and has classified them "in relation to the organs in which they occur, rather than on the basis of the microorganisms which cause them.". The laudable intent of aiding differential diagnosis by this method of presentation has not been fully realized. Once one has located "epidemic myalgia" as an "infection of the musculoskeletal system" (which is unproved), he finds no discussion of the similar symptoms of influenza or dengue. He must look for these diseases respectively under Infections of the Upper Respiratory Tract or Systemic Infections with Primary Manifestations in the Skin. Nuggets of clinical information shine through in almost every chapter, but they often remain unworked gold, since many of the discussions are so cursory. The author is most effective in his general chapters, such as Principles in the Treatment of Infection and in a lucid discussion of aseptic meningitis in which his clinical experience is evident. It is regrettable that this otherwise useful handbook is marred by careless writing which leads to the implication that afebrile herpes labialis is followed by a rise in the titer of neutralizing antibody to the causative virus and which garbles the description of the hemagglutination-inhibition test for mumps antibody to the point of meaninglessness. Although decisions on relative importance must be arbitrary, one may question the 14 pages given to poliomyelitis as compared to only 1½ pages devoted to miliary tuberculosis and the three pages devoted to anthrax as compared to only one on the

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These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

more common adenovirus infections. As the author points out, "the field of infectious disease is expanding and not contracting." This fact may explain the difficulties in presenting concisely in one volume the diagnosis, prevention, and therapy of a large and heterogeneous group of diseases.

Progress in Arthritis. Edited by John H. Talbott, M.D., and L. Maxwell Lockie, M. D. Cloth. $12.50. Pp. 456, with illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16; 99 Great Russell St., London, W. C. 1, England, 1958.

The purpose of this symposium is to bring together under one cover the current views on several aspects of arthritis, rheumatism, and connective tissue diseases. Each contributor emphasizes present-day concepts and evaluations of recent advances. While the book covers a wide range of subjects related to the field of arthritis, it is not all-inclusive and could hardly serve as a textbook on rheumatic diseases or a guide for the beginner. It lacks cohesiveness and does not follow an organized pattern but, rather, presents a collection of individual papers. However, each paper is well done and authoritative. The illustrations and plates are excellent, and the bibliographies are extensive. This book offers little that is not available in the current literature. Its value lies in the fact that it provides a stimulating symposium for those interested in the prevailing thoughts in the field of rheumatology.

The Future of the Welfare State: Seven Oxford Lectures. By the Rt. Hon. Iain Macleod and others. Paper. 2s.6d. Pp. 87, with illustrations. C. P. C. number 178. Conservative Political Centre, 2-8 Victoria St., London, S. W. 1, England, 1958.

The seven alert British public figures who offer in this booklet their current thinking on the present and future of the welfare state seem to agree that utopia has not yet been reached in England. In his preface, Peter Goldman, Director of the Conservative Political Center, finds in "squalor" the primary disfigurement of modern British society. "There are close to one million slum houses in Britain that have been declared unfit for human habitation: one home in every fifteen. There are slum schools and slum hospitals and slum prisons which likewise reproach a modern community. There are slum roads . . . air pollution . . . [and] untreated sewage." Crime, juvenile delinquency, and a weakening of "the moral mortar which holds the social fabric together" are matters for real concern. Goldman calls for an "opportunity state" to match and sustain the welfare state, one to be rooted in the activities and decisions of exceptional men and women. In such a state, he believes, much more would be spent for social provision, since national resources would expand to make this possible. With an accent on finality, Iain Macleod notes that "the National Health Service, with the exception of recurring spasms about charges, is out of party politics," yet he calls for the building of new hospitals, the reform of mental health laws, and "the constant encouragement of voluntary effort in all its forms." Aside from this, there is little in these essays on medical needs or services. It is clear that in Great Britain there is little likelihood that a clarion call for major changes in the National Health Service will come from political figures who are ever alert to the necessities of accumulating voting majorities. "It is time to revert from crabbed age to youth," writes J. Enoch Powell, M. P., former Financial Secretary to the Treasury. By this, however, he means no more than a simple transition from a discussion of old-age pensions to a consideration of universal education for youth. Dr. Mark Abrams, reporting on class distinctions in Britain, has little to say about conflict in society rooted in age. Readers of THE JOURNAL will recall in this connection that the March 1, 1958, issue carried a discussion of "The Younging of Electorates" which pointed out that the proportion of young voters to old voters in a nation is a shifting thing—not a constant. In Britain, for example, the population continues to age. The peak year at which voters over the age of 50 years will have their highest percentage of the total vote will not come until sometime after 1978 (even though it will arrive in Australia in 1961, New Zealand 1962, France 1965, and the United States in 1970). Perhaps the authors of these essays are correct in their apparent assumption that the future of the welfare state in England is unlikely to be affected by a revolt of youth—aided by an increase in their proportional numbers in the population, but one would like to have their views on the matter in some future publication.

The essay "Class Distinctions in Britain" should be read by all Americans who are fond of advocating the easy transplanting of British social service methods to United States soil. It reveals in simple tables and readable summary statements the shocking extent to which Britain consists of people "who know their place." The author himself notes, "I think, then, that we have enough evidence for concluding that we are a class society—the British people willingly grade their fellow men into class-designated groups and they regard these groups as forming a hierarchy of prestige." There are those in the United States who, as a preliminary to their hopes for converting the nation into a totally government-controlled state, labor mightily to increase class consciousness among their fellows. This is a distinct disservice to those who founded the nation as a haven against just such invasions of the freedom and opportunity of the individual. Nor do we look forward to the formation of political parties rooted in distinct class allegiance among the voters. We deplore tendencies in this direction which have already appeared in some heavy industrialized parts of the United States. The future of the British welfare state does not emerge clearly from these seven essays. This is not surprising, since its preface calls it "a symposium, not a composite message," and notes the lack of homogeneity in the writers. American readers, nevertheless, will sense on reading that, as these leaders say, it is hard to turn back the socioeconomic clock, even if grievious mistakes may have been made. This will be something to bear in mind as Americans plan and legislate the future of their own social welfare.

Die Infekotionskrankheiten des Menschen und ihre Erreger. Bände I und II. Herausgegeben von Prof. Dr. A. Grumbach und Prof. Dr. W. Kikuth. Unter Mitarbeit von R. E. Bader et al. Cloth. 198 marks; $47.15. Pp. 840; 841-1702, with 56 illustrations. Georg Thieme Verlag, Herdweg 63, (14a) Stuttgart, West Germany; [Intercontinental Medical Book Corporation, 381 Fourth Ave., New York 16], 1958.

These two volumes are not intended to serve as textbooks. Rather, the authors have as their aim the presentation of a broad, general, all-inclusive treatment of the subjects of infectious diseases. Historical references as to the development of the present concept of a given disease, the clinical types, prophylaxis, and treatment are given in detail. Emphasis is placed on microbiology and parasitology. The various parasites (protozoa, fungi, bacteria, richettsias, and viruses) are discussed in detail. Pathogenesis, epidemiology, diagnosis, therapy, and prophylaxis are treated in a comprehensive manner. An extensive bibliography is appended to each chapter. The authors have accomplished the huge task of bringing up to date the available information as to the varied aspects of the problem of infectious diseases in man. The two volumes should prove of great interest to the epidemiologist, bacteriologist, internist, and general practitioner who can read German.

Pathology for the Physician. By William Boyd, M.D., Dipl. Psychiat., M.R.C.P. [Formerly titled The Pathology of Internal Diseases.] Sixth edition. Cloth. $17.50. Pp. 900, with 501 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1958.

Dr. Boyd's "Pathology of Internal Diseases" first appeared in 1931 and became immediately recognized as superior in its field. Since then it has maintained a great popularity, as evidenced by five editions. It now appears in a more comprehensive form under a new title and is essentially a new book rather than a revision of the old. It describes the diseases of the heart, arteries, kidneys, respiratory system, and other areas. The pathology is related constantly to fundamental anatomic and physiological bases on the one hand and to clinical manifestations and pathogenesis on the other. A final chapter on the internal environment serves to tie together many of the disorders of the organs and systems discussed in the earlier chapters. Admirably illustrated and up to date, the classic morphology is reinforced by the results of electron microscopy, of histochemistry, and of fluorescence microscopically applied to specific problems of pathology. Perhaps the book's most consistent quality is readability. Seasoned with an individual viewpoint, written in matchless language, and spiced with an occasional enlivening hyperbole, books by this author have contributed in no small degree to the progress in medicine of our time. For many physicians "Boyd" was the book that made pathology palatable and understandable by bridging the gap between the basic and the clinical sciences. This present volume lives up to the high standards of the author. New and helpful features have been added, both in arrangement and in format. Each chapter is begun by an outline of the material to be covered, listed in order of presentation. This increases the availability of the individual discussions and decreases the time necessary to find a particular subject. The double columns on each page make reading easier. The paper, binding, printing, and quality of reproduction of pictures are superior. This book is intended for the graduate student rather than the undergraduate, the physician rather than the pathologist, and the young rather than the old. For these selected groups, it should prove most useful. The undergraduate, the pathologist, and the old, however, should not wish to be excluded from the riches contained in this volume.

Laboratory Medicine: Hematology. By John B. Miale, M.D., Professor of Pathology, University of Miami School of Medicine, Miami, Florida. Cloth. $13.75. Pp. 735, with 201 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1958.

This is a large, well-conceived, and well-executed book. It is the first of a series of three volumes on various aspects of laboratory medicine. Its purpose is to emphasize the correlation between laboratory and clinical data, and it is intended for the student, clinician, pathologist, and medical technologist. Although all could profit from the book, the pathologist and clinician will probably be its greatest users. The first six chapters deal with such aspects of the blood and marrow as morphology, derivation, composition, techniques of examination, interpretation of results, and critical evaluation of methods. Many of the descriptions of techniques are detailed and well handled, such as those on supravital staining and phase contrast microscopy. The illustrations in this section, as well as those of electron microscopy, are excellent. There is an excellent section on the cytochemistry of cells that gives a brief but concise review of present knowledge. In chapter 3 there is a group of interesting and illustrative case reports that, although they bring out some important points, have a questionable place in a book of this kind. Chapter 7 deals with transfusions, chapters 8, 9, and 10 with the anemias, and chapter 11 with diseases involving leukocytes. These are all well written and give a better than average review of the conditions discussed. In chapter 12 hemostasis and blood coagulation are discussed logically and clearly, controversial matters being, insofar as possible, avoided. The appendix deals comprehensively with methods. There are a few faults to be found with this book. The color plates are poor in detail and color reproduction, in contrast to the black and white illustrations that, by and large, are good. The bibliography following each chapter is extensive but not critically selected. All in all, subject matter is treated with objectivity, simplicity, and clarity. The index appears to be complete.

Operative Surgery. Volume 7: Breast, Genito-Urinary System. Under general editorship of Charles Rob, M.C., M.Chir., F.R.C.S., Professor of Surgery, St. Mary's Hospital, London, and Rodney Smith, M.S., F.R.C.S., Surgeon, St. George's Hospital, London. Cloth. $19.50. Various pagination, with illustrations. [F. A. Davis Company, 1914-16 Cherry St., Philadelphia 3]; Butterworth & Co. (Publishers) Ltd., 88 Kingsway, London, W. C. 2; England; 1367 Danforth Ave., Toronto 6, Canada, 1958.

Each contributor to this volume outlines the indications, technique, choice of anesthesia, position of the patient on the operating table, and the preoperative and postoperative care for a given operation. The operations are carefully detailed, with numerous excellent line drawings. The part dealing with radical mastectomy by Victor Riddell is outstanding. Unfortunately, no mention is made of resection of a small portion of the rectus fascia at the lower end of the incision to interrupt lymphatic drainage to the abdomen. A limited, selective, primarily British bibliography appears at the end of each section. Added references from the world literature would add to the value of this work. A consistent and pleasing style has been maintained by careful editing. The book is a pleasure to read, and it should be useful to interns, residents, and the "occasional" surgeon.

Physics for the Anaesthetist, Including a Section on Explosions. By Sir Robert Macintosh, D.M., F.R.C.S.E., F.F.A.R.C.S., Nuffield Professor of Anaesthetics, University of Oxford, Oxford, William W. Mushin, M.A., M.B., B.S., Professor of Anaesthetics, Welsh National School of Medicine, University of Wales, Cardiff, and H. G. Epstein, M.A., Ph.D., F.F.A.R.C.S., First Assistant, Nuffield Department of Anaesthetics, University of Oxford. Second edition. Cloth. $15.50. Pp. 443, with 379 illustrations by Miss M. McLarty and Miss M. Beck. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England, Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This book has become a classic for the anesthesiologist. It has been anticipated and anxiously awaited by those who have read the first edition. Its authors have dealt with physics in a simple, direct, but scientific fashion so that the average, well-trained physician might pick it up and read any chapter with ease. It is so well and simply written that there should be no difficulty in understanding the physics concerned in the field of anesthesia. The book is printed on excellent paper and is neatly organized, with clear, accurate illustrations in sufficient number to clarify the text. About the only criticism might be that more emphasis is placed on British equipment than on American, but this is a minor flaw. The new section on explosions should be read by all physicians, nurses, and technicians working in the operating room. The section on pressure-reducing valves has been expertly rewritten. This book covers a wider field than the title implies, for it deals with such matters as flow meters, fluid and gas flow, and diffusion which would be of interest to other than the anesthesiologist. Every medical school and hospital library should have this book, and many anesthesiologists will want to have their own copy.

Pediatric Gynecology with Sections on Urology and Proctology. By Goodrich C. Schauffler, M.D., Assistant Clinical Professor of Obstetrics and Gynecology, University of Oregon Medical School, Portland. Fourth edition. Cloth. $9. Pp. 349, with 84 illustrations. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1958.

In this new edition of an already popular book, the author presents his material in a clear concise fashion which makes for easy reading by the overburdened physician. A new and illuminating chapter on the importance of early diagnosis and medical treatment of pseudohermaphroditism is included, along with a conservative, common-sense approach to the problems of masturbation in children. The author advocates surgical intervention where labial adhesions are persistent, although Anderson and others believe in letting nature take its course. There is an interesting discussion on the pros and cons of circumcision of the clitoris, along with beautifully portrayed pictures of the technique. Anyone dealing with adolescents should appreciate the well written chapter on disorders in adolescence, which differentiates the variations in normal body structure and secondary sexual characteristics from pathological abnormalities. The family physician and pediatrician are shown the need for adequate history taking, physical examination, and laboratory tests in the child with delayed menarche. Special examinations include determination of estrogen concentration in blood and urine, endometrial biopsy, examination of vaginal smears, determinations of the vaginal hydrogen-ion concentration, and tests for thyroid function. This exceptional chapter is worthy of painstaking study. A discussion of treatment of secondary amenorrhea, which is becoming more prevalent in the adolescent age group, should have been included in this chapter. In the chapter on proctology, discussion of hemorrhoids in infants and children was omitted. Every gynecologist, pediatrician, and general practitioner should have this book in his library.

QUESTIONS AND ANSWERS

POLIOMYELITIS VACCINATION AND NEPHRITIS

To the Editor:—*Two children developed acute glomerulonephritis two and five days after being injected with poliomyelitis vaccine. Could there be any connection between the vaccination and their glomerulonephritis, or is it a mere coincidence? Would it be safe to give them a second injection? Is there any contraindication to giving poliomyelitis vaccination to persons who are convalescing from glomerulonephritis? Is the presence of traces of albumin with occasional red blood cells and hyaline casts in the urine without any other symptom of impairment of renal function a contraindication?*

George Jacovides, M.D., Nicosia, Cyprus.

Answer.—At the time of the field trials with Salk poliomyelitis vaccine, some concern was expressed by some clinicians as to possible kidney damage, in view of the fact that the vaccine contains minute quantities of kidney protein. The review of the data collected during the trial, bearing on possible reactions in vaccinated children, failed to indicate any apparent relationship to kidney disease. Since then, other investigators have studied exhaustively the kidney function in vaccinated and in control groups, confirming also the lack of any such association. Consequently, on the basis of these data, a second dose of vaccine could be given the two children to whom the question refers. The routine administration of vaccine is contraindicated in general during acute illness. The presence of "traces of albumin with occasional red blood cells and hyaline casts in the urine"—which may last some months—does not appear to be a contraindication for poliomyelitis vaccination.

EDEMA FROM INSECT BITES

To the Editor:—*What can be done about the edema following insect bites, probably those of mosquitoes? Is there anything that can be done to prevent its occurring?*

John R. Orndorff, M.D., Park Ridge, Ill.

Answer.—The relief of edema in a sensitive reactor can be accomplished with any active antihistamine in adequate dosage. If the edema is severe enough, even with the bites of mosquitoes, corticosteroids may be used in adequate dosage orally. If the patient is a persistently sensitive reactor, then attempts at hyposensitization should be made with commercial extracts of mosquitoes. If a mosquito type is not known, a polyvalent antigen should be used. Skin tests should be done in the usual fashion before injections are given. Also, it is well for the individual who is such a severe reactor to consider use of repellents with due regard to the limitations of time of protection with such an agent and the area to which it is applied. Diethyl toluamide is recommended as a repellent. In some situations, area control of insects by chemicals and use of protective clothing may be needed.

ATHEROGENIC INDEX

To the Editor:—*Please give information on the present consensus of opinion about the "atherogenic index": 0.1 (S_f0-12)+0.175 (S_f12-400). 1. Is this type of formula gaining acceptance as being reasonably helpful or reliable in predicting proneness to coronary disease? 2. Is it felt likely that, when the level of the lipoprotein class S_f12-400 is elevated, it is helpful to reduce greatly the daily carbohydrate intake and that restriction of intake of saturated fats is helpful only when the level of lipoprotein class S_f0-12 is elevated? 3. Is it actually recommended to use two or three injections of heparin weekly for an indefinitely prolonged time as a way of lowering the level of S_f12-400? 4: Is thyroid extract clinically worthwhile in euthyroid persons or as an antiatherogenic measure if S_f elements are elevated? 5. If carbohydrate is the more important factor in atherogenesis in some persons (assuming no overweight is present) rather than saturated fats, why have most well-known studies of the "epidemiologic" sort stressed only the fat intake of groups or populations? Is the idea of high carbohydrate intake as a factor still rather new or simply not accepted by most authorities?*

Alan J. Leonard, M.D., Long Beach, Calif.

Answer.—The questions asked pertain to the value in atherosclerosis of predictive and therapeutic measures based largely on theories of the role of derangements in lipid metabolism in the pathogenesis of the contemporary "captain of the men of death." All the questions are under active investigation in many institutions, but the results of the studies are not wholly concordant and do not yet permit unequivocal answers. 1. The "atherogenic index" undoubtedly has much statistical and

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The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

some individual predictive value in coronary disease. But the predictive value is not accepted by many workers in the field as being greater than that of the simpler, less expensive, and more readily available determination of the serum cholesterol level. Studies of the prognostic significance of the atherogenic index have generally used coronary disease as the criterion; this consultant is not acquainted with findings indicating whether this value is different in cerebral atherosclerosis. 2. There is little evidence that restriction of carbohydrate is specifically helpful when the S_f12-400 level is elevated or that restriction of saturated fats helps only when the S_f0-12 level is high. 3. There is no consensus that prolonged heparin injections are "worthwhile" in the treatment of atherosclerotic disease, whatever the lipoprotein content of the plasma, other than to the extent that they function as anticoagulants. 4. It has not been established that administration of thyroid extract is "clinically worthwhile" as an antiatherogenic measure in euthyroid persons. 5. The significance of variations in carbohydrate intake in the pathogenesis of atherosclerosis has not been established but merits consideration as an accessory factor because the body can convert carbohydrate to fat. Epidemiologic studies have stressed the lipid content of the diet because arterial atheroma was first produced experimentally by feeding cholesterol to rabbits, because it has long been known that diabetes, myxedema, xanthomatosis, and other diseases with hyperlipidemia predispose strikingly to atherosclerosis, and because in some countries where the incidence of coronary disease is low the proportion of calories in the diet supplied by lipids is low and that supplied by carbohydrates is high.

HYPOPIGMENTATION FOLLOWING PLANING

To the Editor:—*Following dermabrasion some patients cannot "tan" in the areas that have been planed. To be more specific, the planed area burns red (along with adjacent areas) but then fades to a pale pink or white within two to five days while the surrounding or unplaned areas assume a normal tan. This has been observed even up to two years after planing. Is there any way a patient can obtain an even sunburn so that the areas of previous planing will not be sharply demarcated from the adjacent unplaned skin? Please comment on the use of methoxsalen (locally and orally) along with that of any other drugs or treatment.*

M.D., Mexico.

Answer.—The problem posed in this question is a most unusual one. The common pigmentary disturbance following dermabrasion is hyperpigmentation, especially due to exposure to sunlight. The only reasonable explanation would be that the chromatophores which normally cause tanning have been injured by the planing in the cases mentioned. Treatment with methoxsalen might be attempted, although it would be impossible to predict the results to be anticipated due to lack of experience in the use of such agents after planing. However, sunshine is more injurious than beneficial to the skin. Its well-established role in the production of premature aging of the cutaneous covering of the body and its effect in causation of keratosis and epithelioma suggest that this intolerance of the planed skin to sunshine may be a blessing in disguise. Especially in women, the cosmetic disfigurement described might inspire the sufferer to exercise restraint and perspective in exposure to solar radiation. Nudists magazines to the contrary, tanning of the skin is not desirable except as a conversation piece.

Answer.—Depigmented spots which follow dermabrasion of the face signify destruction of the melanoblasts within these areas. Frequently the damage is spontaneously repaired within a period of 3 to 18 months. If no tanning has occurred after two years have elapsed, it usually means that the destruction is permanent. This consultant knows of no method, including the use of methoxsalen, by means of which such spots can be made to produce pigment. The wearing of make-up to which a sunscreening chemical has been added will hide the spots and prevent an erythematous reaction when the face is exposed to the sun.

OCCUPATION AND HEALTH

To the Editor:—*A 56-year-old man works in a large department store operating a machine to stamp monograms on linen with a dye. He suffers from general muscular aches, nervousness, and retrosternal discomforts, as do three of his fellow workers. A fifth employee in his department suffers from bladder symptoms. The dye is said to contain a phosphorus compound. No evidence of a metabolic or systemic disease has been found in the patient. Could his symptoms represent an industrial intoxication?*

M.D., Illinois.

Answer.—Consideration of the influence of occupation on health is highly important. Careful investigation of the work situation, identification of the dye, knowledge of its toxicology, and an understanding of the extent and character of exposure are necessary. Channels for obtaining the required information are the department store's medical supervisor and a representative of the store's management. After chemical identification of the dye has been made, information regarding its toxicology may be available in standard textbooks on toxicology if it should be a well-known material. If it is not well known, such information must be sought from the manufacturer of the dye or from the toxicologist or industrial hygienist of the local or state health department (or labor department in a few states). In view of the nature of the patient's complaints, it would appear to be necessary, furthermore, to observe him at work in the customary operation of the stamping machine and to check other possible causal exposures or factors both at home and at work. Such investigations, while time consuming, are necessary for accurate diagnosis and, in turn, proper therapy for the patient. A less careful and less scientific approach can be a disservice to the patient and a discredit to the physician.

PREGNANCY AT 38 YEARS OF AGE

To the Editor:—*Please give information on the probabilities of pregnancy in a 37-year-old woman, previously unmarried, who is concerned over the chances of having a family in a contemplated marriage. Menstrual history is normal, and physical examination shows no abnormalities.*

M.D., Georgia.

Answer.—This woman need not be concerned over the fact that she now is 37 years old and will be 38 or 39 years old when she has her first baby, provided she is under the care of a competent obstetrician during her pregnancy and labor. The inquirer is referred to Greenhill's "Obstetrics" (ed. 11, Philadelphia, W. B. Saunders Company, 1955, p. 698) and Eastman's "Williams Obstetrics" (ed. 11, New York, Appleton-Century-Crofts, Inc., 1956, p. 422).

STERILIZATION OF ELECTRIC CLIPPERS

To the Editor:—*In carrying out institutional barbering, there is a concern with proper sterilization of the barber's tools, especially the electric hair clippers. The patients on a particular ward have their hair cut on a given day, one after another at short intervals. What is considered the most effective method of accomplishing sterilization of the electric clippers, and what solution is recommended for sterilizing the combs and scissors?*

James M. Louisell, M.D., Augusta, Mich.

Answer.—Disinfection of barber's tools may be effected by immersion in solutions of any of several types of agents, including hexachlorophene soaps, quaternary ammonium compounds, ethyl or isopropyl alcohol, formalin, cresols, and others. Bichloride of mercury and mercury cyanide are not recommended. The blades of electric clippers can be removed from the "head" of the unit for immersion. These, as well as other metal tools, should be immersed only in solutions containing rust-inhibitors (i. e., sodium nitrite and diethylaminoethanol). Thorough mechanical cleansing should precede use of a disinfectant solution which, in turn, should be rinsed off. For disinfection of clippers between patients, scrubbing the blades with a small brush soaked with a disinfecting solution, followed by proper rinsing, is recommended. Clean and disinfected towels, combs, scissors, and brushes should be used on each patient. Regular use of medicated shampoos, in conjunction with the above, should minimize the incidence of scalp infections.

MOUTH BREATHING AND ADENOIDECTOMY

To the Editor:—*Is mouth breathing alone a sufficient indication for adenoidectomy in a 2½-year-old child? There is no history of ear or throat infections, or of any other illness, and no evidence of facial or palatal deformity. The child is of normal weight and development. The sole complaint is of mouth breathing, chiefly while asleep.*

Harold I. Rodman, M.D., Washington, D. C.

Answer.—Mouth breathing alone may be a sufficient indication for adenoidectomy. However, there are other causes for mouth breathing in a 2½-year-old child who is presumably normal otherwise. A careful nose and throat examination might reveal a markedly deflected septum or engorged turbinates due to allergy, often made worse at night because of sensitivity to feathers, mattress dust, or woolen blankets. There might be present a unilateral atresia of the posterior choanae, since it is not likely that a bilateral atresia would have gone unnoticed for two and one-half years. Tumors or masses may be present in the nose or nasopharynx, viz, polyps or fibromas. Also, it is possible to have a combination of the above factors which might cause nasal blockage at night, giving rise to mouth breathing. A rather infrequent cause is the falling back into the pharynx of a large tongue, giving rise to partial dyspnea and mouth breathing. In general, however, enlarged, obstructing adenoids are usually the chief cause of mouth breathing in a young child while asleep. Hence, if no other pathology is found, an adenoidectomy would certainly be indicated.

HEAVY WATER EXCRETION

To the Editor:—*A report appeared about 10 years ago which showed that experiments with administration of heavy water revealed that the kidney does not excrete water taken in the same day. Heavy water is said to remain in the system for 21 days. If it is a fact that the body excretes water only after storing it for three weeks, how can water be labeled for stated purposes?*

Frederick W. Proewig, M.D.
Wantagh, Long Island, N. Y.

Answer.—Heavy water is uniformly distributed throughout the entire water of the body approximately two hours after ingestion or injection of deuterium oxide into a normal person. The rate of equilibration is slower in patients with edema or a failing circulation. After equilibration, it will be excreted at the rate of turnover of the body's water, which would mean a gradual dilution of the heavy water of the body. It will be continually excreted in the same proportion as it exists in the body fluids. The kidney does not distinguish between heavy and ordinary water, and it is not correct to say that it is retained for 21 days. Some of the heavy water will remain in the body for 21 days or longer, according to the rate of turnover of the body water in that particular individual. Heavy water may be procured commercially. Its estimation requires concentration and the estimation of specific gravity of the concentrate. The report of Faller and others (*J. Lab. & Clin. Med.* 45:748, 1955) gives further details.

LICENSING OF PILOTS WITH DIABETES MELLITUS

To the Editor:—*What restrictions are placed on the licensing of private pilots who have diabetes mellitus and who require insulin for its management?* *M.D., Wisconsin.*

Answer.—The policy of the Medical Division of the Civil Aeronautics Administration at the present time regarding airmen having diabetes mellitus and requiring the use of insulin is as follows: "A history of diabetes mellitus requiring the use of insulin is disqualifying for any type of medical certificate." Therefore, medical certification cannot be made in these cases.

PATHOGENS IN TOBACCO

To the Editor:—*There are those among us who persist in smoking. How is tobacco treated to prevent the transmission of pathogens, such as fungi or even tubercle bacilli, in cigars, cigarettes, pipe tobacco, and snuff?*

M.D., Utah.

Answer.—A temperature of 131 to 150 F is used to destroy pathogenic organisms and bacteria in milk. In the different methods of curing, fermenting, and aging of tobacco, apparently similar temperatures are used, particularly during the aging process. Thus, transmission of most pathogens is unlikely.

SWIMMERS' ITCH

To the Editor:—*A patient who returned from a duck-shooting trip in Mexico has symptoms of swimmers' itch. Response to treatment has been slow. Please give advice on effective medication.*
T. Edwin O'Brien, M.D., Lockport, N. Y.

Answer.—The treatment of swimmers' itch (cutaneous schistosomiasis) is one of palliation. The application of a preparation such as calamine lotion or calamine liniment, with, if necessary, an antipruritic agent incorporated, should afford relief, and since there is an element in these cases of sensitization perhaps the addition of antihistaminic drugs would be useful. Swimmers' itch is usually acquired from fresh water lakes; seabathers' eruption occurs from salt water. The two diseases have distinguishing characteristics which are fully described in standard textbooks on dermatology.

EXCESSIVE UNDERARM PERSPIRATION

To the Editor:—*With reference to the query on excessive underarm perspiration which appeared in* The Journal *for June 28, 1958, page 1194, I wish to report a simple method of treatment for localized hyperhidrosis of axillas, palms, and feet which has proved highly successful. The following solution is used: copper sulfate, 0.5 Gm.; potassium dichromate, 2.5 Gm.; mercuric chloride, 5.0 Gm.; and enough distilled water to make 100 ml. The treatment consists of painting the hyperhidrotic areas with this solution. One to three applications are sufficient to give complete relief. In order that toxic quantities of mercuric chloride may not be absorbed from the skin, painting is done on only one or two areas at a time, once every three to seven days. The treatment is painless and does not smart or burn. No adverse local or systemic effects from this simple therapy have been observed. Odoriferous feet become dry and odorless even after the first application. The urine of treated patients has been repeatedly examined for albumin and casts, and findings have always been negative. Obviously, the treatment should be administered by the physician in his office. No skin biopsies have been done for study of the condition of acrine and apocrine glands after treatment, but presumedly these glands are rendered atrophic.*

D. A. Berberian, M.D.
389 Loudonville Rd.
Loudonville, N. Y.

The above comment was referred to the consultant who answered the original question, and his reply follows.—Ed.

To the Editor:—*Immersion baths with bichloride of mercury for patients with various skin diseases, particularly pityriasis rosea, have actually been used, so one need not be afraid of the mercurial content of this prescription. However, such baths do indeed entail the possibility of intoxication and have been seen to incite bloody diarrhea in the past. Chrome dermatitis is a serious thing once it has been induced.*

CONSANGUINEOUS MARRIAGE AND HEREDITY

To the Editor:—*I would like to point out several errors in the answer given to the question on consanguineous marriage and heredity which appeared in* The Journal *on Jan. 4, 1958, page 110. The answer stated: "If the husband's ancestors have been healthy, physically and mentally, for at least three generations, there should be no particular reason for concern, from a biological* *point of view." Most of the deleterious genes known in man are recessive, and only infrequently can one discern a carrier of such genes by looking at him. A perfectly normal individual may, and probably does, carry several "bad" genes. Also, there is nothing magic or significant about the number three in connection with the number of generations. Deleterious recessive genes have been known to remain in the heterozygous condition, and therefore unnoticed, for many successive generations. The answer also mentions the long brother-sister inbred line of the Ptolemies and the lack of ill effects noticed there. There is some question about the accuracy of the pedigree as given. Asdell (*Human Biol. 20:*171, 1948) corrected this popular misconception. He gave the pedigree which shows that the inbreeding coefficient is zero for most of the individuals from Ptolemy I to Cleopatra the Great. Cleopatra the Great, herself, was not at all inbred. The last sentence of the answer causes the most concern: "In consanguineous marriages, even in this extremely close degree, the characteristics of the offspring are influenced by the traits in their ancestry, not by the fact of kinship." Kinship alone does make a difference. Much evidence has been accumulated from normally crossbreeding organisms (e. g., corn, fruit flies, mice, and man) to show that inbreeding lowers fitness. Recently, Morton and others (*Proc. Nat. Acad. Sc. 42:*855, 1956) summarized investigations in man which show an increase of child mortality among the offspring of consanguineous marriages. They estimate that in addition to other possible deleterious recessive genes, the average person carries the equivalent of three to five recessive lethal genes which exert their effect in the early life of the individual. But all this discussion of inbreeding and the ancestors of the husband is beside the point, because no matter how inbred the husband may be, his offspring will not suffer if he marries an unrelated woman. Since the husband and wife in this case are not related, the coefficient of inbreeding of their children will be zero.*

T. H. Roderick, Ph.D.
University of California
Berkeley, Calif.

The above comment was referred to the consultant who answered the original query, and his reply follows.—Ed.

To the Editor:—*The foregoing very intelligent comment on the effects of marriage of kin goes farther than is necessary, perhaps, for the purposes of the physician who is consulted on a specific case. The commonest question concerns marriages between first cousins, and these amount to only about 1 in every 200 marriages in the United States at the present time. The layman will not understand much about corn, fruit flies, and mice, but he understands that marriages between cousins of sound stock have produced many fine families—Charles Darwin and his wife are one of the classic examples. Of course, there is nothing magic or significant about the number three in connection with the number of generations studied, but that is as far as the average person has any detailed information about his ancestry. The most recent study of the subject (Tanner, *Eugenics Rev.,* Jan., 1958) found "no consistent differences between cousin and non-cousin fertility and child mortality rates which could suggest that genetic or endemic disease factors might be involved." Asdell, in the study cited in the comment, concluded that differences in intelligence of offspring studied were due to differences in intelligence of their parents, not to the fact that the parents were kin (supposedly brother and sister, although, of course, the truth about matings 2,000 years ago is somewhat problematical). There is no question that many recessive traits may pass along unseen for generations. There is no question that they are a little more likely to be manifested in the offspring of marriages between cousins than in those from the matings of unrelated persons. There is some unknown risk in any mating, and if two cousins of sound or superior stock want to marry there is little empirical evidence to discourage them and some empirical evidence to encourage them. This matter of the effects of marriage between cousins is one of general interest, even though the number of such marriages is dwindling rapidly on this continent because of such factors as the increased mobility of the population and the smaller number of children (which means that people do not have as many cousins as their grandparents did).*

CORRECTION

Disinfection of Water

Since the publication of the table in the question and answer on disinfection of water in The Journal, Jan. 25, 1958, page 427, certain inconsistencies have been noted. The corrected table appears below.

Utilization of Common Materials for Disinfection of Water

	% Available Cl_2 or I_2		To give 2,000 ppm Cl_2 or I_2		To give 10 ppm Cl_2 or I_2	
Product*	Given on Product	By Titration	Quantity†	No. Cups Solution (Made up to)	Quantity†	No. Gal Solution (Made up to)
Clorox (Cl_2)..	5.25	5.3	1t	½	1T	21
Zonite (Cl_2)..	0.9	1.0	1T	5T	1T	4
HTH (Cl_2)...	70.0	67.0	1 tablet	7	1 tablet	65
Lugol's solution (I_2) (U. S. P.) ..	5	4.8	1t	½	1T	19
Tincture of I_2 (U. S. P.) ..	2	2	1T	⅔	1T	8
Globaline (I_2).	39.5-42.6	...	...	...	2 tablets	¼

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* These are examples of compounds commonly available which may be used for disinfection. Proprietary products will vary in different sections of the country. An inventory of compounds possessing bactericidal properties, common to the specific locale, should be made.

† T=tablespoon, t=teaspoon.

WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

Medical Education and Research Interest Secretary Flemming . .

Loans and Grants to Aid Education to Be Established Shortly . .

Pan American Sanitary Bureau Reports on Year's Activities . .

SECRETARY FLEMMING INTERESTED IN EDUCATION, RESEARCH EXPANSION

The new Secretary of Health, Education, and Welfare, Arthur Flemming, is giving serious consideration to the Bayne-Jones report, which calls for national spending of one billion dollars a year on medical research by 1970. Some of the report's recommendations may find expression in HEW's next budget.

Asked at a news conference what was being done about the report, issued in July of this year, the Secretary said it was under serious consideration. "I want to assure you it will not be put on the shelf to gather dust," he declared.

The report, which envisages a broad expansion of medical education and medical research, now is being studied by Secretary Flemming and his staff. Later, he said it would be discussed with the Bureau of the Budget and the White House and agreement reached on a long-term goal.

Secretary Flemming, giving every indication that the Bayne-Jones study was being well received by his department, said the thought was to develop "year-by-year" toward whatever goals are set for medical research and education. By mid-October, he said, the Budget Bureau will be given some indication of what impact the report's recommendations will have on the next HEW budget. By Dec. 1 the department will have its budget ready.

The committee was appointed by then Secretary Folsom to make a comprehensive study of medical education and research. The chairman was Dr. Stanhope Bayne-Jones, former Yale medical dean and former head of the joint administrative board of New York Hospital–Cornell Medical Center. Members were prominent medical educators and research directors in private industry.

In commenting on the report, Secretary Flemming emphasized the high calibre of the men who made up the committee and said that their recommendations deserved careful consideration by the government.

The report recommended that United States triple its expenditures for medical research and that it double its output of physicians in the next 12 years. It suggested that the U. S. supply about half the total research funds, or half a billion dollars by 1970, with industry and private philanthropy contributing an equal amount. The U. S. now pays about 56% of total medical research costs. The report also urged that between 14 and 20 new medical schools be built, with an immediate start on them, to supply researchers as well as to maintain the physician-to-population ratio.

The committee said that in its opinion dangers of federal control of medical research could be avoided through "vigilant and sustained" application of safeguards.

FEDERAL EDUCATIONAL LOANS AND GRANTS TO START SHORTLY

Officials of the Department of Health, Education, and Welfare and the U. S. Office of Education are hurrying preliminary work on the recently-enacted program of loans and grants for education with the objective of getting a start on the project before the end of the year.

The emphasis is on improved teaching and student selection in the sciences, Mathematics, and foreign languages. While medicine is not singled out for special treatment, premedical and medical students generally are eligible for assistance, and the strengthening of primary and secondary school science courses and improvement in pupil guidance should identify more prospective medical students.

A question arises in the case of medical schools that are not a part of a larger general education institution. According to an Office of Education official, there is some possibility that students in such medical schools will not be allowed to share in the benefits until the law is amended.

The Office of Education has the following general timetable:

"Funds will be made available to state education agencies and institutions after they have developed plans for the programs and have applied for federal funds. It is expected that a few of the programs will get under way during the first half of the current school year, others during the second half, and that all or virtually all will be in full operation by the opening of school next year.

"Forty-five state legislatures will be meeting in January and thus will be able to enact any necessary state legislation and make needed appropriations for matching funds.

"One of the first steps will be a series of planning conferences of state officials, college representatives, and others with the U. S. Commissioner of Education and members of his staff. The first such conferences already have been held with a committee of chief state school officers and a committee of higher education associations."

There are four phases of the over-all program that ultimately will affect medicine.

College Student Loans.—The law authorizes $47,500,000 for the current fiscal year, but, because the program would be slow in starting, Congress has appropriated only 6 million dollars; this can be increased by deficiency appropriations after Congress meets in January.

Institutions themselves will handle the U. S. loan money, but they will have to put up at least one dollar for every $9 in U. S. funds. Interest at 3% will be due after the student has completed his full-time course, and he will have up to 11 years to repay.

It is expected that about 11,000 federally-supported loans of $600 will be made the first year.

Strengthening of Instruction in Elementary and Secondary Schools.—Grants will be available to states to help public institutions (including public junior colleges) buy laboratory and other special equipment and for remodeling, loans will be available to nonprofit private institutions for the same purposes, and grants will be offered states to expand or improve their supervisory and administrative services.

For the three programs, Congress has authorized 70 million dollars this year, but, as in the case of student loans, has appropriated less—19 million. Grants for equipment will have to be matched dollar-for-dollar from the start, but matching will not be required the first year for grants to strengthen school administration.

It is estimated that equipment for a typical general science laboratory in a high school will cost about $6,000.

One effect of these grants will be to offer more and better science courses in primary and secondary schools, with the result that more and better students may be expected to become interested in medical as well as other science careers.

National Defense Fellowships.—This phase is designed to expand graduate education so as to increase the supply of well-trained college teachers, medical school teachers included. The Office of Education expects that some of these fellowships will be processed by February of 1959. A total of 1,000 fellowships are authorized for the current fiscal year and 1,500 each of the next years.

Improved Guidance and Counseling.—Congress has appropriated $5,400,000 (of a 15 million dollar authorization) for the first year of this program to improve mechanism for the identification and encouragement of able students through testing, guidance and counseling.

Institutions of higher education are instructed to apply directly to the U. S. Office of Education for contracts to set up training institutes, a few of which may be in operation by the end of school next spring.

No state matching will be required the first year, but after that federal funds will have to be matched dollar-for-dollar.

It is estimated that 15 million dollars per year channelled in this direction would produce 1,200 additional full-time guidance and counseling personnel.

Presumably improved guidance would recognize potential medical students at an earlier age and keep them on the proper preparatory course.

PASB REPORTS ON HEMISPHERE'S FIGHT AGAINST DISEASE

A Pan American Sanitary Bureau report coverin medical progress in the Americas over the last fou years concludes that many killing and crippling dis eases are now in retreat on the continent. The re port, released in Washington, also is being distrib uted to the 15th Pan American Sanitary Conferenc meeting in San Juan, Puerto Rico.

The bureau says the report should prove inva uable to public health administrators in tacklin their health problems and planning future program Some of its findings are the following:

Vital Statistics.—Communicable disease is show to be the main cause of death for all ages, but es pecially in childhood. Mortality in early childhoo (1 to 4 years) varies from 1.1 to 42.7 per thousan in different countries in the Americas. A major fac tor in mortality in early childhood is shown to b malnutrition. The report, therefore, points to th need for national and local health services to develop stronger maternal and child health programs and to place greater emphasis on improvement in nutrition.

Communicable Diseases.—The report emphasizes, in addition to eradication programs for smallpox, yaws, and malaria, that programs for the prevention of diphtheria, whooping cough, leprosy, plague, poliomyelitis, [illegible] typhoid fever, and typhus be strengthened. Although much progress has been made toward reducing these diseases in a number of countries, they are still a major health problem in many others.

Medical and Health Personnel.—Country by country data on medical and health personnel is to be found for the first time in this report. It shows a need, in most cases an acute need, for more trained medical and nursing personnel. In one country, 71 of all doctors and 82% of all graduate nurses are reported to be employed in health services on a part-time basis. Such information as this can serve as a guide in preparing educational programs and in national planning for the number and types of personnel needed in a given country in an expanded health program.

Local Health Services.—The report summarizes the personnel, the activities and services, and the geographical coverage of the local health services of each country—information that should be useful in extending local health services to the entire population. Today three countries in the hemisphere provide such full local coverage. Five others offer local coverage for 80% of the population: all other national percentages are lower.

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STAPHYLOCOCCIC EMPYEMA

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A thoracic empyema is more than a collection of pus in the pleural space; it is an actual abscess. The inflamed pleurae form its walls, and it is commonly divided by bands and adhesions into subspaces with little apparent intercommunication. It usually develops by lymphatic bacterial drainage into an initially sterile pleural effusion, by direct extension from the lung itself, by rupture of a subpleural abscess, by septic embolization, or by traumatic or iatrogenic contamination. For rapid and complete healing the abscess must be completely evacuated. Antibiotics must be used with pinpoint accuracy, or a chronically ill patient will come to harbor an organism resistant to all usual antibiotics. These principles are illustrated by ten case reports.

WHILE MOST physicians ascribe to the treatment of purulent collections, such as a pelvic or subdiaphragmatic abscess, by surgical drainage, many apparently do not consider an acute empyema in the same light.[1] There are, perhaps, logical reasons for this attitude. Empyema is usually a complication of an antecedent illness; it is insidious in onset, and the diagnosis is frequently overlooked. When diagnosed, it can be readily followed by roentgenographic examination and most often appears accessible to thoracentesis and local therapy. With this in mind, many physicians will perform repeated aspirations and local instillation of antibiotics, which may be successful, although therapy is thereby prolonged and potentially dangerous. More insidious, however, is the false assumption that all acute empyemas may be treated in this manner, particularly those of staphylococcic origin.

An empyema is more than a purulent collection in the pleural space. It constitutes an actual abscess, and the pleurae, formerly thin and glistening, are now abscess walls—thickened, granular, inflamed, and supporting a pyogenic growth. In addition, the pleural space, in reaction, develops bands of fibrous tissue which make tortuous and sinuous extensions with little apparent communication between the different partitions. To assume that daily aspirations of a small amount of pus will empty this space is wistful thinking. For rapid and complete healing, the abscess must be completely evacuated,

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From the Department of Surgery, the George Washington University Hospital, and the District of Columbia General Hospital.

the partitions separated, and the space obliterated. Failure to perform this will result in a functionless, trapped, compressed lung, and more extensive surgical treatment will be needed for reexpansion of the lung and cure of the empyema.

Although some cases of acute staphylococcic empyema, if treated early, will respond to thoracentesis, local instillation of antibiotics, and enzymatic débridement,[2] to prescribe this as the preferred treatment is dangerous. Actually, many patients whose disease responds to thoracentesis and antibiotic therapy have infected effusions without true abscess formation. The empyema may be aborted but not cured, since it has never existed. For the most part, pinpoint accuracy of the antibiotic is the key factor,[3] and, in combating the staphylococcus, this has been only temporarily achieved when a new antibiotic is introduced. When resistance develops, conservative treatment again results in a prolonged period of multiple inadequate attempts of thoracentesis with eventual failure; the chronically ill patient now harbors an organism resistant to all antibiotics, well past the optimum time for the most effective and simple surgical drainage.

The following case reports, collected in the past two years at the District of Columbia General Hospital and the George Washington University Hospital, are presented to illustrate this problem and to reemphasize the necessity of early surgical drainage when dealing with staphylococcic empyema.

Report of Cases

Case 1.—A 40-year-old woman was admitted to the District of Columbia General Hospital on Oct. 22, 1956. The patient, a known alcoholic and epileptic, had a three-week history of cough, chills, fever, and bilateral pleuritic pain. Physical examination revealed a blood pressure of 120/70 mm. Hg, a pulse rate of 104 per minute, a respiration rate of 48 per minute, and a temperature of 104 F (40 C). There were moist rales bilaterally with dulness to percussion and decreased breath sounds in both lung bases. X-ray examination showed a right lower lobe pneumonia with a small pleural effusion. The sputum was collected for smear and culture, and the patient was given tetracycline (Achromycin), 500 mg. intramuscularly every six hours. Despite clinical improvement, the pleural effusion increased and thoracentesis three days after admission was productive of 600 cc. of a cloudy fluid, which was subsequently found to be negative on culture. The temperature rose during tetracycline therapy, and fluid subsequently drawn by thoracentesis was positive on culture for Staphylococcus pyogenes var. aureus, coagulase positive. Erythromycin was then given, 500 mg. four times daily. Multiple thoracenteses with streptokinase-streptodornase (Varidase) instillations proved unsuccessful. Surgical drainage was performed on Nov. 15, 1956, with prompt remission of the fever and a satisfactory result.

Case 2.—A 66-year-old woman was admitted to the District of Columbia General Hospital on Feb. 1, 1956, because of a productive cough, fever, dyspnea, and general malaise of six months' duration. Studies on the medical service established the presence of a massive left pleural effusion and pneumonia. Sputum examination showed many pneumococci, and the patient was given novobiocin (Albamycin), 500 mg. every six hours. After one week no improvement was demonstrable, and antibiotic therapy was changed to that with erythromycin and then in four days to that with tetracycline, 500 mg. every six hours. Multiple thoracenteses were productive of small amounts of purulent material. After one month, no improvement was seen and open drainage was instituted. Cultures of the fluid at this time were positive for Staph. pyogenes var. aureus, coagulase positive. Nine days after drainage, the temperature was normal and the antibiotic therapy was discontinued. After prolonged treatment with irrigations, the patient made an uneventful recovery.

Case 3.—A 53-year-old woman was admitted to George Washington University Hospital on Aug. 12, 1956, because of persistent fever, chest pain on the right, and a 20-lb. (9.1-kg.) weight loss after an episode of pneumonia two months previously. At that time, she was given a diagnosis of right lower lobe pneumonia and therapy with chloramphenicol (Chloromycetin), 250 mg. every four hours, and 500 mg. of tetracycline given intravenously daily for four days was instituted. Sputum cultures revealed hemolytic streptococcus, Staph. pyogenes var. aureus, and Proteus vulgaris. Therapy with the above antibiotics was discontinued, and that with penicillin, 300,000 units every four hours, and streptomycin, 0.5 Gm. twice daily, was started after cultures were reported moderately sensitive to these drugs. The patient was discharged from the hospital after two weeks of this therapy.

On subsequent admission to the George Washington University Hospital, examination confirmed the presence of an empyema of the right pleura. The patient was operated on under local anesthesia; a modified Eloesser flap was performed with resection at part of the sixth and seventh ribs at the posterior axillary line. A copious amount of purulent material was removed which, on culture, grew Staph. pyogenes var. aureus, coagulase positive, resistant to all the commonly used. antibiotics. She was therefore not given antibiotics, but irrigation with saline solution for mechanical débridement was done frequently. After one week, the empyema cavity measured 55 cc. and she was discharged with the drainage tube in place. She continued to receive treatment at home until the space measured 10 cc. in volume, when the tube was removed. Her total period of drainage was almost four months.

Case 4.—A 16-month-old child was admitted to the District of Columbia Hospital on Feb. 17, 1957, in acute respiratory distress, breathing 48 times a minute, with a temperature of 105 F (40.5 C) and a pulse rate of 130 per minute. The patient had an upper respiratory infection for one week. which was treated by the family doctor with one injection of penicillin. The child appeared to have nuchal rigidity, and a spinal tap was done. The fluid was normal. Roentgenographic examination showed complete obliteration of the left lung field, and thoracentesis was performed. Fifty cubic centimeters of pus was removed, a smear of which showed gram-positive cocci. Therapy with chloramphenicol, 250 mg. every six hours, was started and underwater tube drainage performed. The patient made gradual improvement, and the underwater drainage was converted to open drainage. On the 41st hospital day, he developed septicemia, with Staph. pyogenes var. aureus, coagulase positive, resistant to all antibiotics except novobiocin. The chloramphenicol therapy was discontinued, and novobiocin, 100 mg. every six hours, was given for one month. The empyema space completely resolved, and the patient was discharged on May 29, 1957.

Case 5.—A 59-year-old man was admitted to the George Washington University Hospital on July 13, 1956, because of persistent fever and left upper quadrant pain after a fall two weeks prior to admission. One year before, he had suffered a cerebrovascular accident. One month prior to admission, the patient was treated for left upper quadrant pain and fever; at that time a diagnosis of urinary infection was made, and he had a remission of his symptoms.

Examination revealed an elderly, chronically ill man with aphasia and severe rheumatoid arthritis. Temperature was 102.2 F (39 C), blood pressure 140/90 mm. Hg, respiration rate 22 per minute, and pulse rate 90 per minute. There were residuals of a hemiplegia on the right side and dry rales in the right upper and left lower regions of the chest. There was tenderness in the left upper quadrant and axillary line without guarding or muscle spasm. Laboratory examination revealed a hematocrit value of 33%, leukocyte count of 9,750 per cubic millimeter, blood urea nitrogen level of 12 mg. per 100 cc., and amylase level of 7 units per 100 cc. The urine showed many clumps of bacteria, and a culture of it was positive for Staph. pyogenes var. aureus, coagulase positive. An electrocardiogram showed nonspecific T-wave changes. An x-ray of the chest revealed a fluid level in the left lung base representing a walled-off empyema or lung abscess. Thoracentesis was productive of green, bloody, purulent material that was positive on culture for Staph. pyogenes var. aureus, coagulase positive. The patient was operated on and tube drainage with water seal suction applied. Penicillin, one million units daily, and streptomycin, 1.5 Gm. daily, were given. The clinical response was good. A few days later rib resection and Eloesser flap construction were done. Therapy with erythromycin, 200 mg. every six hours, was begun at this time, and the patient made an uneventful recovery. He was transferred to another hospital for nursing care and rehabilitation.

Case 6.—A 54-year-old woman was admitted to George Washington University Hospital on June 30, 1956, because of fever, cough, and weight loss of one month's duration. The patient was being treated for an upper respiratory infection for one month prior to admission with inadequate doses of antibiotics. She was referred for admission because of deterioration of her condition and recent pain on the right side of her chest. She had had poliomyelitis at the age of 7 years and had a residual partial paralysis of her left leg.

Chest x-ray showed complete opacity of the right lower part of the chest and homogeneous densities in the right upper part, suggesting fluid or consolidation. The left lung was clear. Thoracentesis was performed and 40 cc. of purulent material aspirated. This was positive on culture for Diplococcus pneumoniae, and penicillin, 600,000 units twice daily, was given. The organism was sensitive to all antibiotics. Surgical consultation was obtained the following day, and tube drainage was performed with the patient under local anesthesia. Posterior and anterior pockets were encountered and two tubes inserted. Approximately 1,000 cc. of pus was obtained which was positive for only Staph. pyogenes var. aureus, coagulase positive, which was sensitive to all antibiotics except penicillin. The patient was given erythromycin, 250 mg. every four hours, and was discharged 10 days after surgery. The empyema space had decreased from a 1,000-cc. volume to a 38-cc. volume in that period. She was followed in the outpatient clinic and made an uneventful recovery.

Case 7.—An 11-year-old boy was admitted to George Washington University Hospital on March 20, 1957, because of persistent fever and pain of one month's duration on the left side of the chest. The boy was hospitalized one month previously at another hospital, for similar complaints, and examination at that time revealed a temperature of 104 F (40 C), pleuritic pain on the left side of the chest, a leukocyte count of 20,000 per cubic millimeter, with 90% polymorphonuclear cells, and a diffuse haziness on x-ray of the left lung field. Thoracentesis was nonproductive, and he was given a broad-spectrum antibiotic and penicillin. His fever subsided, and, because of a strongly positive intermediate PPD test, he was discharged on therapy with streptomycin and isoniazid. Several days after discharge his temperature was again elevated, but repeated x-ray examinations showed no change and no pulmonary findings could be elicited. A histoplasmin agglutination test was recorded as 1:16 one week prior to admission, but a second test just before admission was not diagnostic.

Physical examination showed a chronically ill boy. X-ray of the chest at this time showed a circumscribed mass at the upper posterior mediastinum on the left. Findings on examition were entirely normal except for an elevated white blood cell count of 22,300 per cubic millimeter, with 56% segmented cells, 1% band cells, 41% lymphocytes, 1% monocytes, and 1% eosinophils. With the patient under local anesthesia, an empyema pocket was found by needle aspiration. Drainage required resection of a small portion of the left seventh and eighth ribs about 2 cm. lateral to the transverse process.

Over 200 cc. of foul-smelling pus was removed. This was positive on culture for Staph. pyogenes var. aureus, coagulase positive. The patient was placed on therapy with penicillin and streptomycin for five days, and with drainage he had prompt remission of his fever. He was discharged to the outpatient department in one week and was subsequently treated with frequent irrigations until the volume of the space was reduced to 5 cm. of water, when the tube was removed. The patient required no antibiotics after discharge, and the space was closed in approximately five weeks.

Case 8.—A 9-month-old boy was admitted to the District of Columbia General Hospital because of a persistent fever and pharyngitis. He was given penicillin for two days and tetracycline orally for one day as an outpatient.

Examination disclosed an acutely ill, listless infant with a temperature of 105.6 F (40.9 C) and a respiration rate of 40 per minute. The patient had minimal pharyngitis, bilateral otitis media, diffuse rhonchi throughout both lung fields with decreased breath sounds, and dulness to percussion over the right side of the chest. An x-ray the following day showed a mottled infiltration in the right lung field with pleural effusion obscuring most of the right side. Because of four loose bowel movements, the patient was placed in isolation and given fluids intravenously. Penicillin, 300,000 units every six hours, and sulfisoxazole (Gantrisin), 1 Gm. per pound of body weight administered intravenously, were given. The following day a throat culture was reported positive for Staph. pyogenes var. aureus, coagulase positive. The temperature was still elevated to 104 F (40 C), the respiratory rate was 70 per minute, and the pulse rate was 200 per minute. Intravenously given novobiocin, 100 mg. per pound of body weight for two doses and then 50 mg. per pound every six hours, was given. The fourth hospital day no improvement was noted. Thoracentesis was performed and 20 cc. of cloudy fluid removed. Novobiocin, 100 mg., and penicillin, 300,000 units, were instilled. The patient was digitalized. He then continued to have daily thoracentesis and antibiotic instillation performed without x-ray signs of improvement or clinical evidence of response. On Sept. 21, 1957, the ninth hospital day, surgical consultation was obtained and tube drainage in the seventh intercostal space at the mid-axillary line was performed. The patient became afebrile in four days, and the tube was removed in approximately one month. He showed gradual improvement, although possible cyst formation, characteristic of staphylococcic pneumonia, was noted in the lung.

Case 9.—A 12-month-old girl was admitted on Feb. 22, 1957, to the District of Columbia General Hospital for treatment of second and third degree burns of both hands accidentally inflicted at home one week prior to admission. Physical examination showed a well-developed, well-nourished child. Temperature was 100 F (37.7 C), pulse rate 140 per minute, and blood pressure 120/80 mm. Hg. There was a mucopurulent upper respiratory infection, second and third degree burns of the palmar surface of both hands with gross secondary infection, epitrochlear and axillary adenopathy, and rhonchi in both lung fields.

X-ray on the day after admission showed a right basilar pneumonia. One week later, after surgical débridement of the burns, a diagnosis of left lower lobe pneumonia was given. During this time she was being given tetracycline, 30 mg. per pound of body weight every four hours. The patient was becoming tachypneic, and x-ray showed opacification of the entire left lung with mediastinal shift to the right. On March 10, 1956, her 10th hospital day, she became comatose. Thoracentesis was performed and 70 cc. of pus removed. Medical consultation was obtained, and repeated thoracentesis and instillation of erythromycin, 60 mg. four times a day, was advised.

Culture of the fluid obtained on thoracentesis was positive for Staph. pyogenes var. aureus, coagulase positive. Multiple thoracenteses were performed for the next 10 days with some resolution in her fever but with no significant x-ray evidence of improvement. Surgical consultation was obtained, and on March 20, 1957, surgical drainage and Eloesser flap formation were performed in the left eighth intercostal space at the left mid-axillary line. She was given chloramphenicol in addition to the erythromycin, and she showed gradual improvement until her discharge on June 16, 1957.

Case 10.—A 50-year-old man, a chronic alcoholic, was admitted to the District of Columbia General Hospital on April 1, 1956, because of pleuritic pain on the left, cough, and fever of one week's duration. Physical examination showed temperature 102.6 F (39.3 C), blood pressure 142/90 mm. Hg, pulse rate 108 per minute, and respiration rate 22 per minute. The patient had decreased breath sounds, dulness to percussion, and increased tactile and vocal fremitus over the left upper part of the chest. X-ray examination showed a left pleural effusion obscuring the lung field. Gram-positive cocci were found in the sputum, and the patient was started on a regimen of multiple thoracentesis with locally and parenterally given penicillin. Culture of the pleural fluid on April 24, 1956, was positive for Staph. pyogenes var aureus, coagulase positive. The patient was then started on therapy with erythromycin, 500 mg. every six hours, but showed no improvement; he was subsequently given chloramphenicol, 1 Gm. every six hours. On May 11, 1956, the 40th hospital day, surgical drainage was instituted, and the patient showed rapid improvement. The tube was removed on June 7, 1956, although the empyema space was not measured at the time. Three weeks later the patient showed a recurrence of his empyema, and a study with use of iodized oil (Lipiodol) revealed a space measuring 30 cc. Accordingly, dependent tube drainage was reinstituted, and, after a prolonged period of drainage and irrigation with saline solution, the empyema cavity was reduced to 5 cc., the tube was removed, and the patient was discharged on Oct. 3, 1956. During the course of treatment, the patient had a total of 30 thoracenteses done and cultures made. Only two of these showed infection with Staph. pyogenes var. aureus, coagulase positive, which was sensitive to chloramphenicol and resistant to penicillin, streptomycin, oxytetracycline, and tetracycline. This illustrates one of the adverse effects of giving antibiotics before establishing the diagnosis.

Comment

While most frequently staphylococcic empyema is secondary to a primary bacterial or virus pneumonia, it may be secondary to an entirely extrathoracic infection. The most common method for the development of an empyema is one of the following ways: by lymphatic bacterial drainage into a sterile pleural effusion, by direct extension from the lung itself, by rupture of a subpleural abscess, by septic embolization, and, lastly, by external traumatic or iatrogenic contamination.

All are illustrated in the cases reported here. The mechanism usually varies with the age and primary illness of the patient. In the infant, direct pleural extension from the rupture of a small subpleural abscess during the course of a staphylococcic pneumonia is the most common mechanism. In adults, staphylococcic pneumonia is less common, and, hence, most cases of staphylococcic empyema result from the invasion of the pleural effusion associated with a primary bacterial or virus pneumonia. In the older or chronically ill patient, septic embolization from an extrathoracic source, such as the urinary tract, is a common cause, while in the acutely il debilitated person, such as is seen with severe bur cases, hematogenous dissemination may occur.

Although the mortality due to staphylococci empyema has been greatly reduced from its previous high of 50 to 70% in infants and children,[1] the morbidity is still significant. This is due to tw factors: delayed diagnosis and inadequate treatment. The diagnosis is frequently difficult. Mos adult patients present themselves because of a feve of undetermined etiology after one of the above mentioned processes. Serial or multiple-view roentgenographic examination may reveal pleural fluid This most often presents itself in the costophreni sulcus but may be loculated in the anterior or posterior paramediastinal region and easily obscure on x-ray. In the very young, a characteristic acute bleb formation associated with pneumonia, pleural effusion, and/or pyopneumothorax is quite pathognomonic of staphylococcic infection. This bleb formation was noted in two of the above cases and in 25% of the 41 cases of staphylococcic pneumonia and empyema in children, as reported by Kanof and coworkers.[1b] It is believed to be due to a bronchiolar obstruction with the resultant empysematous bleb formation and is to be differentiated from the usual abscess formation which may also occur. These are frequently so large that they are mistaken for a pneumothorax, and inadvertent puncture of the lung with a resultant tension pneumothorax is one of the dangers of repeated thoracentesis for staphylococcic empyema.

The diagnosis, however, must be confirmed by performing thoracentesis with use of meticulous aseptic technique. If purulent material is encountered, surgical drainage, of course, should be performed. Most patients, however, will have received various antibiotics and, in the early stages, have a cloudy effusion which may or may not be positive on culture. It is at this point that inadequate management usually results, and repeated thoracentesis with local instillation of antibiotics is initiated. If an effusion is obviously clear, is a transudate, and is negative on culture, surgical drainage, of course, should not be done. But if an effusion is milky and in reality represents an early empyema, which can be demonstrated on smear and/or culture, then surgical drainage should be instituted before a chronic empyema results.

The surgical treatment should begin with adequate localization on x-ray, requiring posteroanterior, lateral, and right and left anterior oblique films. Several thoracenteses may be necessary to adequately localize the empyema. Drainage is then instituted. Two types of drainage may be used, depending on the nature of the pus. If a nonloculated fluid is present in the costophrenic sulcus, underwater intercostal tube drainage is necessary. Open drainage would result in a pneumothorax. The empyema of several weeks' duration with a localized accumulation of pus presents a different problem. Because of the inflammatory reaction, pleural symphysis and thickening is present over the remaining lung and the empyema represents a true pocket. This may be drained without underwater protection because the pleural symphysis will prevent the development of a pneumothorax. The site of drainage will depend on the location of the lesion but will usually be in the 6th intercostal space if the pocket is anterior, the 7th or 8th interspace, if lateral, or the 9th or 10th space if posterior because of the varying level of diaphragmatic attachment. The dome of the diaphragm will hinder adequate drainage at lower levels. The tube should be a large one—of the caliber of a 28 F. catheter—and may be inserted with the patient under local anesthesia. This tube is then connected to underwater drainage and, depending on roentgenographic and clinical findings, should remain in place usually for about one week.

In the empyema of several weeks' duration, a more prolonged period of drainage is necessary. Because of the symphysis, open drainage may be instituted as stated above. The opening, however, should be large enough to admit a tubing 1-in. in diameter and to allow easy irrigation, since in this type of empyema mechanical débridement by frequent irrigations is usually more important than the effect of the antibiotics. Accordingly, a subperiosteal 2-in. resection of one or two ribs overlying the dependent area of the pocket should be performed with the patient under local anesthesia. If a prolonged drainage time is anticipated, the skin may be sutured to the pleural edge, creating an Eloesser flap.

Once drainage has been instituted, the problem of duration of treatment arises. The patient is naturally anxious to have the tube removed or the drain site closed. The physician at this point may fall into the error of too early termination of the drainage, since the amount of drainage may actually be very small in a 24-hour period. If the tube is removed, the skin will rapidly close over and an apparent healing take place, only to be followed by a recurrent empyema. It is essential that, during the course of treatment, frequent volumetric recordings of the empyema space be made and contrast visualization of the shape and extension of the empyema cavity performed. The latter is easily done by injecting iodized oil, aqueous Dionosil (propyl ester of 3, 5 diiodo-4-pyridone-N-acetic acid in water suspension with carboxymethylcellulose added), or any of the usual contrast material into the space and taking multiple x-ray views with the patient in the decubitus and erect positions. The volume of the empyema cavity is determined by simply placing the patient on his uninvolved side and injecting sodium chloride solution into the cavity until it is filled. Caution must be exerted here on those patients suspected of having a bronchopleural fistula, lest the opposite lung be flooded. For this reason, the contrast visualization should be performed first.

The duration of drainage will depend on the volume and shape of the empyema space. A drain should be left in place until the volume of the space is 10 cc. or less. Occasionally, a tortuous or dumbbell-shaped cavity develops, and one portion of it may become sequestered or partially blocked from the line of drainage. Although the total volume may then be not more than 10 to 20 cc., this will usually require a second drainage site for expeditious healing. Most empyema spaces will heal within 8 to 12 weeks, even though the original space was several hundred cubic centimeters in volume. Once a true empyema is present, the earlier the drainage the less pleural thickening will occur and the easier it will be for the lung to reexpand. Persistent large empyema spaces, trapped lung, or recurrences will require a more radical surgical treatment, which is beyond the scope of this paper.

Summary

Staphylococcic empyema is a serious and not uncommon disease. Once a true empyema has developed, repeated thoracenteses and antibiotic therapy are not only inadequate, but dangerous. Surgical drainage of the abscess is mandatory and the only satisfactory treatment.

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References

1. (*a*) Cohen, P.: Primary Bronchogenic Staphylococcic Pneumonia, M. Clin. North America **22**:1473-1494 (Sept.) 1938. (*b*) Kanof, A.; Epstein, B. S.; Kramer, B.; and Mauss, I.: Staphylococcal Pneumonia and Empyema, Pediatrics **11**:385-392 (April) 1953.

2. Schenck, H.: Recurrent Staphylococcus Aureus Pneumonia and Empyema Treated with Novobiocin: Review of Literature, with Report of Case, J. Pediat. **50**:570-578 (May) 1957.

3. MacKenzie, D. A., and McKim, J. S.: Treatment of Staphylococcal Empyema in Children, Canad. M. A. J. **75**:914-917 (Dec. 1) 1956.

NOISE—IS IT A HEALTH PROBLEM?

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More than 30 centuries ago, according to the old testament, Joshua the son of Nun led the Israelites over the River Jordan and up to the city of Jericho. Here they made camp, and once each day for six days around the walls of the city Joshua led seven priests blowing trumpets made of rams' horns. On the seventh day they compassed the city seven times, and the seventh time when the priests blew on their trumpets Joshua said to the people "shout" and the people shouted with such a great shout that the walls fell down flat. Thus antiquity provides us with the first recorded example of the nonauditory effects of noise. Three thousand years later noise is still blamed, rightfully or not, for a wide range of human ills, from the production of hearing loss to changes in chromosomes to increased admissions to mental hospitals. Today misconceptions about the hazardous effects of noise are rife. It is the purpose of this paper to expose some of these misconceptions and to outline the factual information that is available to help us realistically assess the effects of noise exposure.

What Is Noise?

An entirely satisfactory working definition of "noise" has been difficult to come by. One lexicographer's definition is "Noise is sound without agreeable musical quality." This description has had wide popular acceptance but has proved to be quite inadequate, partly because of the difficulty of defining agreeable musical quality but mostly because of the fact that this quality may be highly undesirable at times. You may keep your taste for contemporary painting concealed from your neighbor, but your taste in modern music cannot easily be confined by walls. What is music of agreeable musical quality to you in your own home may be just plain noise to your neighbor who is trying to sleep, in spite of the excellent performance of your amplifier and loud-speaker system. Definitions of noise based on the physical characteristics of sound have not been satisfactory because the definitive characteristic of noise is not physical but psychological, namely its undesirability. The currently accepted definition is "Noise is any unwanted sound."

The permanent hearing loss produced by extended exposure to certain occupational noises constitutes a serious health problem. The solution to this problem lies in active programs of hearing conservation. Hearing conservation is primarily a medical responsibility. The importance of the physician's recognition of his role in meeting the threat to health cannot be overemphasized.

The physician must acquaint himself with the current knowledge of the relations of hearing loss to noise exposure. Misconceptions about the hazardous effects of noise are widespread. Auditory effects of noise exposure and nonauditory effects are frequently related without justification. For example, the fact that a noise produces annoyance does not, contrary to popular belief, mean that exposure to that noise will necessarily produce a hearing loss. The annoyance caused by noise is a highly individual phenomenon and, as such, is not easily measured or predicted. The fact that a noise produces annoyance does not mean that it is bad for health.

The total amount of hearing loss produced by noise exposure depends on more variables than was thought originally. Before the diagnosis of noise-induced hearing loss can be made the physician must have adequate information about (1) the over-all sound pressure level of the noise, (2) the way the energy in the noise is distributed among the various frequencies present, (3) the typical pattern of daily exposure to the noise, and (4) the years of expected work life in the noise. Answers given by the patient cannot be assumed to be reliable, and the physician must make the necessary effort to obtain the pertinent information from reliable sources.

What kind of measurements must we make to be able to tell how much noise is present in a given situation? Measurement of noise involves measurement of certain physical characteristics of sound. Sound itself consists of propagated fluctuations in barometric pressure. These variations in atmospheric

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pressure may be either periodic or random and are called "sound pressure." Measurements of sound pressure may be used to indicate amount of noise, but it is important to remember that the amount is not the same as the energy in the noise. Just as temperature depends on but cannot be equated to the heat energy present in a body, so the energy in noise is related to but is not the same as sound pressure. It is generally assumed, sometimes incorrectly, that energy is roughly proportional to the square of the sound pressure.

Most instruments for receiving sound, such as microphones or the ear, respond not to the energy in sound but to the sound pressure. For this reason noise measurement scales are based on sound pressure. The smallest fluctuation of barometric pressure to which the young human ear will respond is about 0.0002 of a pressure unit called the microbar. One microbar of pressure is about 0.000001 of normal atmospheric pressure. It follows that the human ear can respond to pressure changes of the order of 0.00000001% of the pressure with which the atmosphere presses on the body. Further, the range of pressure fluctuations to which the normal ear responds is enormous, extending from 0.0002 microbar to 1,000,000 microbars. Because of the astronomical range of figures involved, direct measurements of sound pressure do not provide a convenient scale for measurement of amount of noise.

The decibel scale of sound pressure level was designed to compress this large range of values into a smaller one. The decibel denotes sound pressure measurements combined in a rather complicated way. To find the number of decibels corresponding to a given sound pressure one goes through a three-step calculation. First, the ratio of the measured sound pressure and a standard reference sound pressure is determined. This ratio will have a numerical value. Say, for example, that it is 1,000; that is, the measured sound pressure is 1,000 times larger than the reference pressure. Second, find the logarithm of the numerical value of the ratio; in this case the logarithm is 3. Third, multiply the logarithm by 20: $3 \times 20 = 60$. This number, 60, is the sound pressure level or SPL (in decibels) of the given sound relative to the reference pressure. The word "level" is extremely important. It indicates comparison between the given sound and a reference sound. It connotes a relative measurement, not an absolute one. Sound level meters are designed to read an average sound pressure level in decibels re a standard pressure of 0.0002 microbar. It is important when expressing sound pressure level to identify the reference pressure. More than one such reference is in common use. Hearing level, for example, is expressed in decibels re average normal hearing, not re 0.0002 microbar. Sound-pressure levels typical of familiar noises are shown in figure 1.

Knowledge of just the sound pressure level of the noise is not sufficient to allow us to assess the effects of that noise on man. We must also know something about the way the sound energy is distributed over the different frequencies or tones in the noise. Noises commonly encountered in industry and in our domestic life consist not of single tones but of combinations of perhaps thousands of different tones sounding at the same time. The ear responds differently to different frequencies, and we must have a means of indicating which frequencies are present in a noise and with what intensity. One method of getting this information is to divide the range of audible tones into a series of bands and to measure the sound pressure level in each band. The separate bands are chosen so that the frequency of the highest tone in the band is just twice the frequency of the lowest tone in that band. The highest tone is then an octave above the lowest, and the bands are known as octave bands. A rough picture of the distribution of energy throughout a noise may be seen from a display of the sound pressure levels in each of the octave bands. Figure 2 is such a display. Ordered from lower pitch to higher pitch, the bands include the following frequencies: first, 37.5 vibrations or cycles per second (cps) to 75 cps; second, 75 to 150; third, 150 to 300; fourth, 300 to 600; then 600 to 1,200; 1,200 to 2,400; 2,400 to 4,800; and 4,800 to 9,600. In the discussion that follows we shall refer to (1) over-all sound pressure levels, which are average sound pressure levels of the total noise without regard to the frequencies present and (2) octave band sound

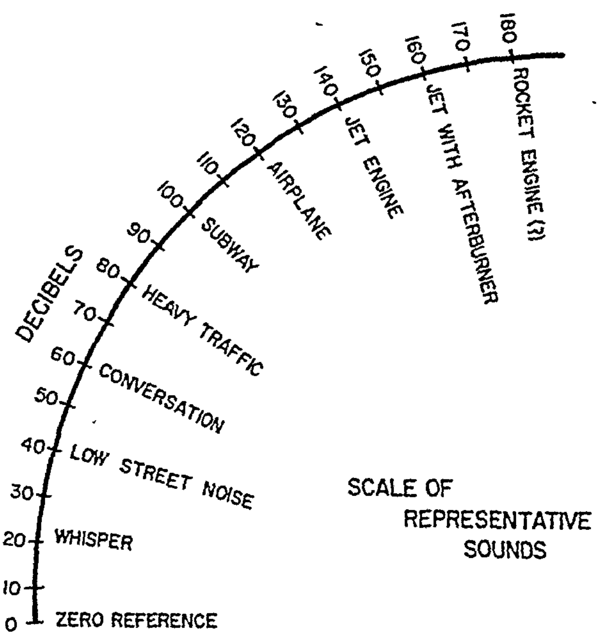

Fig. 1.—Typical decibel sound pressure levels of familiar domestic and occupational noises.

pressure levels, which give a rough indication of how the energy in the sound is distributed among the different frequencies.

Effects of Noise Exposure

The known effects of noise exposure are of two types: (1) nonauditory effects, which cause interference with communication by speech or which otherwise influence behavior and (2) auditory effects, which consist of temporary hearing loss and permanent hearing loss.

Nonauditory Effects.—We will consider first the nonauditory effects of noise exposure.

Speech Interference: Perhaps the best understood nonauditory effect is interference with communication by speech. Noises that are not intense enough to cause a hearing loss may interfere seriously with communication by speech. The average of the sound pressure levels in three octave bands, 600 to 1,200 cps, 1,200 to 2,400 cps, and 2,400 to 4,800 cps is a good indicator of the amount of interference that noise will have on speech communication. This average sound pressure level is called the speech interference level. If one wishes to converse in normal tones with someone who is 5 or 6 ft. away, the average sound pressure level in the three bands must not exceed 50 db. If one is willing to shout, the sound pressure level can be as high as 68 or 69 db. If one is willing to converse in a shout at a distance of no more than 6 in., the speech interference level can be as high as 90 db. Note this last number. Noises with this average sound pressure level in the three octave bands may be potentially damaging to hearing. In fact, a rough way of detecting hazardous noise exposure is to determine whether one must shout at close range to communicate by speech.

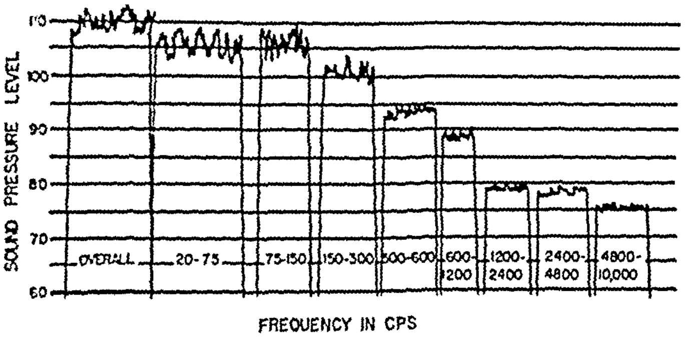

Fig. 2.—Display of over-all and octave band sound pressure levels of noise in multiengine bomber.

Annoyance: Perhaps the most talked about nonauditory effect of noise exposure is annoyance. It is a common error to equate the annoyance produced to the potential menace to health that might result from exposure to the noise. There is no necessary connection between annoyance and potential damage or between lack of annoyance and lack of hazard. Actually certain well-deplored pastimes of the human race attest to the fact that the pleasantness of a stimulus is not necessarily an indication of its beneficial effects on health.

The annoyance caused by noise is largely a psychological response. Noises made by neighbors and by their dogs tend to be more annoying than the same noises made by members of our own households. The annoyance caused by aircraft noise is intensified by the fear that the aircraft may crash onto us. It is especially annoying to have to listen to speech that is just too faint to be understood.

How can we measure annoyance? One way is to check complaints. If the noise brought forth a law suit, it was indeed annoying to someone. There are other less drastic but perhaps less realistic methods for rating annoyance. We can conduct opinion polls and ask community members if such and such a noise is annoying, and we can reproduce noises in the laboratory and ask subjects to rate them according to annoyance. None of these methods is really satisfactory. In general, higher intensity, higher frequency (above 1,500 cps), and intermittency tend to increase annoyance, but there are large individual differences in reaction. Annoyance itself is not a health hazard, and the fact that a noise is annoying does not establish it as a damage risk.

Efficiency: A third nonauditory effect of noise exposure is possible loss of efficiency. Efficiency in performing mental and motor tasks under various conditions of noise exposure has been much studied because of its practical importance. A major weakness in the design of experiments, however, has tended to invalidate most of the studies conducted in industry. This weakness is the failure to control changes in the non-noise-related environment. Frequently when the noise environment changes, it is because there has been a move to a new building or a change in process accompanied by changes in work tasks, in temperature, or in lighting. Changes in efficiency are known to be caused by any one of these non-noise changes in environment.

Other difficulties with industrial tests of efficiency are that the numbers of employees participating in the studies have been too small to average out the effects of individual differences or even to allow us to estimate statistically what effect these differences might have on the results. Further, a psychological factor enters here. It has been found that the performance made on first encounter with a test seems to persist even through environmental changes. This means that if an employee did poorly on a test given to him first in noise, he would tend to do poorly on subsequent administrations of the test, even in quiet—and vice versa. The conclusions drawn from the most reliable tests of efficiency in industrial noise are that unfamiliar noise temporarily reduces efficiency but that when an employee becomes accustomed to the noise his efficiency returns to a non-noise performance level.

Physiological Changes: Certain temporary physiological changes also occur in the human body as a direct result of noise exposure. The usual emergency reactions of the body occur in response to sudden sharp sounds such as gunfire. There may be a sharp muscle contraction over the entire body. The breathing rate may increase. Blood pressure rises. The heart rate increases. There is an increase in sweating. It is possible that a frequent recurrence of these changes might impair health. Fortunately, the magnitude of these physiological responses wears off rapidly with repetition of the noise exposure.

Summary: The interference of noise with speech communication under a variety of conditions is well understood and can be predicted from measurements of the sound pressure level in certain octave bands of the noise. The annoyance caused by noise is a highly individual phenomenon and as such is not easily predicted or measured. The fact that a noise produces annoyance does not mean that it is bad for health. Efficiency in the performance of mental and motor tasks in industrial settings is only temporarily affected by exposure to unfamiliar or intermittent noises. Physiological changes resulting from noise exposure lessen with repetition of the exposure. At typical industrial noise levels it appears that no unhealthy physiological reaction results even from prolonged exposures.

Auditory Effects.—The auditory effects of noise exposure are of two types, temporary and permanent. The existence of temporary hearing loss, often called temporary auditory threshold shift, or TTS, and of permanent hearing loss can be demonstrated easily. The auditory effects of noise exposure constitute a serious health problem. Twenty-five per cent of preemployment audiograms show significant hearing losses. Factory workers show nearly twice the hearing loss that office workers show when ages are the same.

Temporary Hearing Loss: Temporary noise-induced hearing loss is a loss that results from a specific exposure to noise and that disappears in some arbitrarily chosen length of time. Strictly speaking the term "temporary hearing loss" might be interpreted to mean any hearing loss from which the ear recovers, no matter how long a recovery is required. The term, however, has become somewhat restricted by usage to mean either a temporary disability as defined by law or a hearing loss that results from one day's exposure to noise and from which the ear has recovered usually by the next morning. The latter definition describes the temporary hearing loss found in many industrial employees at the end of a working day. Studies of temporary auditory threshold shift have made us aware of several important facts concerning both temporary loss and permanent loss.

In brief, some of these important facts are as follows: 1. The temporary elevations of auditory threshold that result from various noise exposures may range from no change to increases of 35 db. The shift is different for different persons under the same conditions of noise exposure. Also, temporary shifts produced by typical industrial noise exposure are larger at the higher frequencies in the audible spectrum. 2. Most of the temporary loss produced by typical noise exposures occurs in the frequency region between 4,000 and 6,000 cps. 3. Most of the temporary loss produced by typical industrial noise exposures occurs during the first one or two hours of exposure. 4. The amount of temporary loss and its frequency location vary with the amount and frequency location of any permanent loss present; that is, the more permanent the loss at any frequency, the less the temporary shift at that frequency. 5. Temporary threshold shift is a fairly stable quantity. For a given noise exposure the TTS is about the same for a person from day to day. 6. For any given noise exposure, the TTS varies from person to person roughly according to a normal statistical distribution. That is, few persons have very large or very small shifts. The loss in most persons clusters around an average midway between largest and smallest shift.

It is our hope that further intensive studies of temporary hearing loss will furnish valuable information about permanent hearing loss. On the basis of the preliminary studies we assume that (1) if the noise does not produce a temporary loss it probably will not produce a permanent loss, (2) from the amount of temporary loss produced by one workday's exposure we will be able to predict the amount of permanent hearing loss to be expected after years of exposure to that noise, and (3) the shape of the audiogram showing the temporary hearing loss will resemble the shape of the audiogram recording permanent hearing loss produced after years of exposure. These assumptions have yet to be validated by long-term studies of permanent hearing loss.

From a practical standpoint the temporary threshold shift produced by daily exposure to noise is important in areas other than research. For example, temporary threshold shift is included in the hearing losses recorded by industrial audiometry. An audiogram made immediately at the end of a workday of noise will include temporary loss and will therefore not be a true indication of the amount of permanent hearing loss present. Industry requires a true measure of permanent hearing loss, but it is quite impractical for all industrial audiograms to be made after a quiet period sufficiently long to eliminate temporary loss. We expect that highly controlled studies of temporary threshold shift will result in a numerical method of correcting industrial audiograms for contaminating TTS.

Laboratory studies of TTS have demonstrated that continuous exposure and interrupted exposure produce different effects in the ear. If, for example, a noise is on for half the exposure time, that is, if it follows a pattern of one minute on one minute off, the amount of temporary loss is just half that which is produced when the same noise is on continuously. If a similar effect obtains for permanent hearing loss and if employees are allowed relatively quiet periods at intervals throughout the day, then long-term changes in hearing will be less than changes produced by continuous exposure. The ear apparently has some mechanism for recovery during even short rest periods, which seems to make it less vulnerable to loss.

Permanent Hearing Loss: Long-continued exposure to intense noise can produce permanent hearing loss, but the process of production is not well understood. The end-result, namely, the pathology of permanent noise-induced hearing loss, has been demonstrated in animal ears. Noise exposure produces an inner ear damage which may vary from minor changes in the hair cell endings to complete destruction of the organ of Corti. The mechanism of the production of this pathology is not completely known, but it appears that overstimulation by noise for long periods of time produces a metabolic change in the cell which in turn causes degenerative damage to the cell structure.

The specific causal relations of hearing loss to noise exposure are very complex, and many questions must be answered before definite statements can be made about how much hearing loss will result from a given noise exposure. Investigations so far have produced three particularly important pieces of information about permanent hearing loss. First, serial audiograms of persons exposed to intense noise show a characteristic progression of hearing loss. Early losses appear at frequencies between 3,000 and 6,000 cps. Usually losses appear first at 4,000 cps and then in time spread in both directions until hearing for most of the audible frequencies affected. The extent of the spread depends on the amount of noise exposure sustained. Impairment of hearing is usually not noticed until losses at the speech frequencies, 500, 1,000, and 2,000 cps are 20 db. or more. Substantial losses may occur at frequencies from 3,000 cps to 6,000 cps without producing any subjective awareness of changes in hearing. The production of noise-induced hearing loss is a slow and insidious process, and years of exposure may elapse before any significant noticeable loss of hearing occurs.

A second important piece of information about permanent hearing loss is that we cannot directly equate the deleterious effects of noise exposure and the energy content of the noise. That is, double the energy content in the noise does not produce double the hearing loss. We assume that the larger the total energy content of the noise the smaller the time of exposure required to produce a hearing loss, but the exact relation between time and energy is not known.

A third piece of information is that the total amount of hearing loss produced by noise exposure depends on many more variables than was thought originally. Hearing loss varies with the type of exposure and its degree of intermittency, the individual exposed, the total duration of the exposure, and the degree of consistency of use of ear protection.

Noise Exposure and Permanent Hearing Loss: Throughout the discussion we have referred to the hearing loss produced by noise exposure, not by noise. The concept of exposure, of the need for time of development of hearing loss, is important to the physician. Brief exposures to most industrial noises will produce no illness or damage to the ear. Whenever the causal relations of hearing loss to noise are considered, the physician should consider each of the following four factors bearing on noise exposure: (1) the over-all noise level to which the man was exposed, (2) the frequency composition or spectrum of this noise, probably as expressed in octave band sound pressure levels, (3) the duration and time distribution of noise during a typical workday, and (4) the total duration of the noise exposure expected during the work life.

To elucidate the last two factors consider the following example: The physician is often confronted by persons who work in high-level noise areas, perhaps as high as 130 or 140 db. Before drawing any conclusions about the effects of exposure to these noises, the physician must inquire carefully about the length of time spent in the noise. Brief exposures to these noise levels will not produce severe hearing loss nor in most cases even significant hearing loss. On the other hand the physician also encounters persons who work in lower noise levels, perhaps 100 db., and again exposure time is important. The possible effects of extended exposure to these lower levels must not be minimized. In many instances persons who are exposed to the 100-db. noise have much longer total duration of exposure than do the men who work in excessively high noise levels. If the noise level is approximately 100 db. but the exposure has been long, existing hearing loss may be directly related to the noise exposure.

Some industrial noises will produce significant hearing loss only if the exposure continues over 15 or 20 years. Many operations that are associated with these industrial noises, however, are characterized by rapid job turnover. The total duration of exposure for any man's ears may be not more than two or three years. Exposure to the average industrial noise for two or three years usually produces only minor changes in hearing. If the physician does not have this information about exposure, he should ask for it before making a diagnosis.

These statements are based on the result of our experience with continuous noises. We know very little about the auditory effects of impact noises such as blasts, rifle fire, or drop hammer sounds.

Conservation of Hearing

Because prolonged exposure to many industrial noises can produce a permanent handicapping hearing loss, we must depend on conservation as a solution to the health problem created by noise. Through well-organized and properly monitored programs of hearing conservation, noise-induced hearing loss can be either prevented or greatly minimized.

There are certain rules of thumb for assessing the possible need for a hearing conservation program. Whenever persons have (1) difficulty communicating by speech when they are in the noise, (2) tinnitus after working in the noise for several hours, or (3) a temporary loss of hearing severe enough to muffle speech or other sounds, again after several hours of exposure, the noise exposure is severe enough to warrant serious consideration of a conservation program. A hearing conservation program consists of three parts, as described below.

Analysis of Noise Exposure.—First an analysis of the noise exposure must be made. Four separate items are considered in any such analysis, namely, the over-all level of the noise to which employees are exposed; the frequency composition of the noise; the duration and distribution of exposure during a typical workday; and the total exposure expected during a work life. Knowledge of each of these items is important to the design of an effective program. Two noises may have the same over-all level, for example, and yet their frequency compositions may differ so that one may produce a permanent hearing loss and the other may not. The daily duration and distribution of exposure may affect significantly the severity of the expected loss; intermittent exposure is less hazardous than continuous exposure.

Control of Noise Exposure.—The second part of a hearing conservation program is the control of noise exposure. Some noise exposures may be reduced considerably by changes in the physical environment. The amount of noise produced by the source may sometimes be reduced, for example, by replacing metal gears with fiber gears or by lining conveyor chutes with resilient materials, or by changing the manufacturing process, such as by substituting welding for riveting. In other instances it may be possible to reduce noise levels by preventing the transmission of noise through building structures or even through the air. Mounting heavy machinery on shock-absorbing mounts will tend to prevent vibrations from being transmitted through the floors and walls of the building. Enclosing noisy machines or building heavy barrier walls between machines and employees will tend to prevent airborne sound from reaching the ears of men who work in the machine area but who do not need to be near the machine itself.

Sometimes, when other environmental control procedures are not feasible, it is possible to revise operational procedures in such a way that continuous exposures are converted into intermittent ones. In the event that complete environmental control is too expensive to be practical, control of noise exposure may be achieved through the use of personal protective devices or through a combination of environmental control and personal protection.

Measurement of Hearing.—Perhaps the most important part of a hearing conservation program is the third item in the list of three, namely, measurement of hearing. A hearing conservation program should provide both for preplacement hearing tests and for routine periodic follow-up or re-check tests. Preplacement tests provide reference or base-line audiograms from which subsequent changes in hearing may be determined. To provide an adequate base line these preplacement tests must be threshold tests. Air conduction threshold tests are sufficient. Thresholds are usually measured at six frequencies: 500, 1,000, 2,000, 3,000, 4,000, and 6,000 cps.

Threshold measurements at 3,000, 4,000, and 6,000 cps, sometimes called the monitoring frequencies, give a good indication of the status of hearing in the most sensitive region of the ear. Measurements at 500, 1,000, and 2,000 cps give an indication of the status of hearing in the all-important speech region. In the absence of valid speech tests to determine the handicap produced by hearing loss, the average of the hearing level at the three speech frequencies, 500, 1,000, and 2,000 cps, is used to estimate the hearing loss for everyday speech. Handicap begins at levels above 15 db. and is total at about 80 or 82 db.

Preplacement and follow-up tests together help to identify persons who may be highly susceptible to noise-induced hearing loss. A series of follow-up tests will tell whether the conservation program is effective. Because follow-up tests are made not to establish a base line but rather to detect changes in hearing status, the limitations placed on them are not as severe as the limitations placed on preplacement tests, and follow-up tests of hearing may be screening tests. In some situations they may be single frequency screening tests. A rather extensive survey of existing records of hearing loss in many different groups of persons showed conclusively that in more than 98% of the cases reviewed hearing losses at 4,000 cps were as large as or larger than losses at any lower frequency. This result held true for losses of 50 db. or less. The implication is that the threshold of hearing at 4,000 cps may be considered an upper limit for any threshold shift that may have occurred at lower frequencies. A gross check on changes of hearing can thus be made from measurements of the 4,000 cps threshold. Other details of the single frequency or limited frequency screening tests will be found in an article by one of us and House.[1]

Medical Responsibilities.—Ultimately the responsibility for conservation of hearing rests largely with the physician, as emphasized in the following statement [2]:

> The conservation of any human function is primarily a medical responsibility. Hearing conservation is no exception. Prevention, diagnosis and treatment of hearing loss; validation and approval of audiometric records; and the final assessment of measurements of hearing are medical responsibilities. Any hearing conservation program without medical supervision must be considered inadequate.
>
> Direct medical supervision of a hearing conservation program is highly desirable. Here a physician is responsible for the organization and administration of the testing program as well as for checking and evaluating audiometric records. The physician himself does not perform all the operations necessary to the conduct of the program: he delegates responsibility for many of the technical activities to members of his staff, setting up standards or limits within which they can operate semi-autonomously. Whenever medical records show that control of noise exposures may be inadequate, the physician in charge so reports. The responsibility for making necessary noise measurements and for effecting further environmental noise exposure control then devolves on the industrial hygienist, members of the engineering or safety departments or other persons assigned to the task. Although the actual operations of measurement and protection are performed by both medical and non-medical personnel, the physician ultimately is responsible for the health of the employee.

Conclusions

The nonauditory effects produced by typical industrial noise exposures—speech interference, annoyance, changes in efficiency, and physiological changes—do not constitute a health hazard. Whether the nonauditory effects of the extremely high noise levels generated by jet engines and rocket engines will constitute such a hazard remains to be seen.

The auditory effects of noise exposure are a serious threat to health of a large segment of the industrial population. Permanent, handicapping hearing loss can be produced by extended exposure to many industrial noises. We do not yet know enough about the relations of hearing loss to noise exposure to set a safe level of noise exposure. We can say, however, that whenever employees are exposed to continuous noise for at least five or six hours a day, five days a week, 50 weeks a year, for several years; then if the sound pressure levels in any of the three octave bands 300-600 cps, 600-1,200 cps, or 1,200-2,400 cps exceed 85 db., a program of hearing conservation is called for. This hearing conservation level of 85 db. in any of the three specified octave bands does not apply to impact noises. There is not enough information about the effects of impact exposure to allow us to set such a hearing conservation level.

Hearing conservation is primarily a medical responsibility. In our rapidly expanding mechanized civilization noise threatens to become a major health problem. The members of our society look to the medical profession for protection from this threat. The importance of the physician's recognition of his role in meeting the threat cannot be overemphasized.

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References

1. Glorig, A., and House, H. P.: New, Practical Concept of Hearing Testing for Use of General Physician, J. A. M. A. **166:**1719-1721 (April 5) 1958.

2. Guide for Conservation of Hearing in Noise, American Academy of Ophthalmology and Otolaryngology, Los Angeles, Research Center, Subcommittee on Noise, 1957.

ANTIBIOTICS FOR CHILDREN.—The indication is clear that hospital boards may themselves decide to restrict the use of one or more potent antistaphylococcus agents in an effort to retain an "ace in the hole" if a difficult therapeutic problem should arise. Chloramphenicol, novobiocin, and ristocetin might well be restricted voluntarily in order to reserve them for situations of absolute need. A rational approach for the selection of the proper antimicrobial agent in the treatment of children suffering from bacterial disease requires some basic information and a considerable degree of sales resistance to undue or premature advertising claims. It is suggested that the pediatrician formulate a tentative specific etiologic diagnosis when faced with an illness—usually on the basis of clinical impression—but occasionally by employing the help of bacteriologic study prior to the administration of the antibiotic drug and to give such a drug only when indicated. A good rule in therapy appears to be to give a large enough amount of the drug to which the etiologic microorganism is susceptible, by the proper route and as early as possible in infection, and to continue such treatment for an adequate time to ensure eradication of such infection.—C. H. Kempe, M. D., Pediatric Use of Antibacterial Agents, *The Journal of Pediatrics*, July, 1958.

PROLONGED INTERMITTENT STEROID THERAPY FOR NEPHROSIS IN CHILDREN AND ADULTS

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and
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Aqueous ACTH, to induce diuresis, was given for at least 12 but preferably for 21 days, unless marked side-effects necessitated earlier cessation of therapy, to patients with nephrosis and clinical and laboratory findings consisting of massive edema, marked proteinuria (3+ to 4+), hypoproteinemia, hyperlipemia, and, in most instances, a lowering of the serum complement activity. Prolonged intermittent therapy with cortisone, given orally, was begun five days after the onset of diuresis but only when diuresis led to complete freedom from edema. After one year, therapy was gradually terminated by prolonging the intervals between maintenance courses rather than by decreasing the daily dosage. Prolonged intermittent steroid therapy not only resulted in an improved prognosis but also permitted the patients to live a more gainful and happy life. The growth and development of these children has remained within normal limits during and after prolonged intermittent maintenance therapy. Continuous steroid therapy, in contrast, has resulted in marked developmental disturbances.

It is generally accepted[1] that ACTH and cortisone and its derivatives produce remissions of nephrosis in a high percentage of patients. Investigators employing different dosage schedules have observed remissions of varying durations. The purpose of this report is to present the response of a group of patients with nephrosis treated with one specific regimen of intermittent steroid therapy over a prolonged period of time, as originally suggested by one of us.[2]

Selection of Cases

The patients presented in this study had clinical and laboratory findings consisting of massive edema, marked proteinuria (3+ to 4+), hypoproteinemia, hyperlipemia, and, in most instances, a lowering of the serum complement activity. The series includes all of the cases encountered, without exception, of both the so-called pure or lipoid nephrosis and the nephrotic stage of glomerulonephritis (the latter is characterized by elevated blood pressure, increased retention of urea, and a persistent increase of red blood cells in the urine in addition to the nephrotic features). Other diseases which may also be characterized by edema, hypoproteinemia, proteinuria, and hyperlipemia, such as intercapillary glomerulosclerosis (Wilson-Kimmelstiel syndrome), renal amyloidosis, and renal vein thrombosis, were excluded.

Our last report[3] comprised a study of 24 patients. At present, 46 patients (35 children and 11 adults) have been observed for a period of 21 to 84 months, with an average of 40.8 months (fig. 1). The duration of their disease, however, was longer (21 to 159 months) because a number of patients came under observation long after the onset of initial symptoms. All patients have been treated with the same therapeutic regimen.

Therapeutic Regimen

Aqueous ACTH, to induce diuresis, was given for at least 12 but preferably for 21 days unless marked side-effects necessitated earlier cessation of therapy. The following dosage schedule was used: (1) 25 units, intramuscularly, every six hours, for children weighing less than 40 lb. (18 kg.); (2) 40 units, intramuscularly, every six hours, for children weighing from 40 to 75 lb. (18 to 34 kg.); and (3) 50 units, intramuscularly, every six hours, for patients weighing more than 75 lb.

If the first course of therapy with ACTH did not induce diuresis, a second course with the next larger daily dosage for a longer period was administered after an interval of several days. Patients in whom diuresis was not induced by repeated courses of ACTH, cortisone, or prednisone (the two latter drugs were used only occasionally to study their effectiveness) were treated in the following manner: 30 units of ACTH in 800 ml. of 5% glucose in water was given intravenously during a period of approximately eight hours each day for 10 to 14 successive days.

Therapy with cortisone, given orally, was begun five days after the onset of diuresis, but only when diuresis led to complete freedom from edema. The dosage was 300 mg. (for children weighing less than 40 lb.) to 400 mg. (for children weighing more than 40 lb.), given for three successive days of each week. All patients were treated for one year regardless of prior return to normal of clinical and laboratory criteria, since these were found not to be

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reliable for prognosticating the appearance of recurrences. After one year, therapy was gradually terminated by prolonging the intervals between maintenance courses rather than by decreasing the daily dosage. Most recently we have had good results with large doses (36-48 mg.) of triamcinolone (Aristocort) for induction and maintenance.

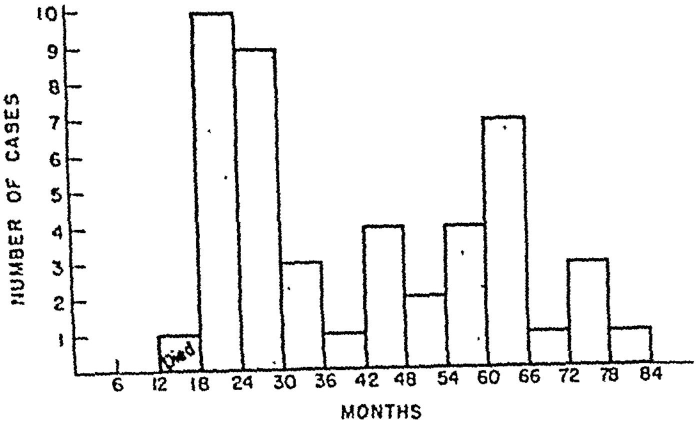

Fig. 1.—Duration of observation of 46 patients with nephrosis (45 living, 1 dead) who were treated with prolonged intermittent steroid therapy.

TABLE 1.—*Therapeutic Results in Patients with Nephrosis—Pooled Data from Group with No Steroid Therapy and Steroid Therapy When Edema Was Noted Compared with That from Group on Prolonged Intermittent Steroid Therapy*

	Control Group*					Maintenance Group				
Period, Mo.†	No. at Start	Entered	Died	Withdrew‡	Death Rate, %§	No. at Start	Entered	Died	Withdrew‡	Deaths Expected, No.
0- 5	18 112 } 160		1 2 } 3	9 0 } 9	1.9		24	0	0	0.46
6-11	38 110 } 148	0 14 } 11	4 7 } 9	4 26 } 30	6.4	24	3	0	3	1.54
12-17	30 93 } 123	0 4 } 4	4 6 } 10	2 10 } 12	8.4	24	6	0	5	2.05
18-23	24 81 } 105	0 2 } 2	0 6 } 6	3 9 } 12	6.0	25	3	0	4	1.47
24-29	21 68 } 89	0 2 } 2	2 6 } 8	1 7 } 8	9.3	24	1	0	2	2.19
30-35	18 57 } 75	0 2 } 2	0 6 } 9	3 5 } 8	12.6	23	3	0	1	3.02
36-41	15 48 } 63	0 1 } 1	1 2 } 3	1 6 } 7	5.0	25	1	0	5	1.13
42-47	13 41 } 54	0 0 } 0	0 1 } 1	1 4 } 5	1.9	21	0	0	3	0.37
48-53	12 36 } 48	0 0 } 0	0 1 } 1	3 2 } 5	2.2	18	0	0	5	0.34
54-59	9 33 } 42	0 0 } 0	0 0 } 0	0 7 } 7	0.0	13	0	1	4	0.00
60-65	9 26 } 35	0 0 } 0	0 1 } 1	2 5 } 7	3.2	8	1	0	2	0.24
			51				41	1		12.81

* Lower figures from Riley.[3]

† The consecutive six-month periods from the 66th to 149th month included, for the maintenance group, the following data: total number of patients at start of periods, 42; total entered, 5; died, none; total withdrew, 12.

‡ Patients transferred to another type of treatment, e.g., no therapy to maintenance therapy, or those who failed to return to clinic.

§ Number who died ÷ number at start of period + ½ number entering during interval — ½ number withdrawing during interval.

The following antibiotics were given: (1) procaine penicillin G in aqueous suspension, 300,000 units, intramuscularly, twice a day until diuresis was induced, followed by (2) penicillin given orally, 200,000 units, once a day for the duration of steroid therapy. (Early in our studies, however, many patients did not receive antibiotics during maintenance therapy.)

Potassium acetate (30% solution), 0.4 Gm. per kilogram of body weight per day, was given to those patients who showed marked sodium retention and weight gain due to steroid administration. The diet was low in salt (less than 1 Gm. per day) but otherwise unrestricted. Fluid intake was not restricted.

Results

A study of the death rate in the group treated with prolonged intermittent steroid therapy as compared with that in the control group was used as a method of evaluating this suggested regimen.

The control group was composed of patients observed between 1946 and 1951 (a period of 65 months) who were given either no steroid therapy or steroid therapy only when edema was noted. Because the treated group had the advantage of antibiotic therapy, only patients observed subsequent to 1946, when antibiotics became generally available for the treatment of intercurrent infections, were used as controls. The date 1951 marks the end of the control period because at this time some form of maintenance steroid therapy was used for the treatment of almost all patients with nephrosis. In the control group were included, with his permission, a number of patients of Dr. C. Riley,[4] to enlarge the total of the control cases.

Table 1 demonstrates, by means of the life table statistical method,[4] the death rate of the control group for each six-month interval that the disease was present during the 65-month period (1946-1951). For example, 1.9% of the patients observed died during the first six months of their illness, and 6.4% died during the second six-month period. The highest incidence of death (12.6%) occurred between two and one-half to three years after the onset of symptoms. The death rate of the control group, for each six-month period, applied to the number of patients observed in the treated group, with disease for the same duration, shows the expected number of deaths during a 65-month period to be 12.8. Actually, only one patient in the treated group died. (One other patient, who died before diuresis could be induced, had had several attempts to induce diuresis with small doses of steroids for 12 months in other institutions and died from an intervening infection.) The probability that this diminished death rate in the treated group was due only to chance is less than one in a thousand (chi square=15.09). Furthermore, observation of the treated group has been extended beyond the 65-month period (for some patients as long as 149 months), and no additional deaths have occurred. Table 1 and figure 2 demonstrate that the actual number of deaths in the treated group was less than was anticipated from applying the death rate of the control group to the number of patients in the treated group. It is less in spite of the assumption that no additional deaths would occur in the control group during a period of observation extended to equal that of the treated group.

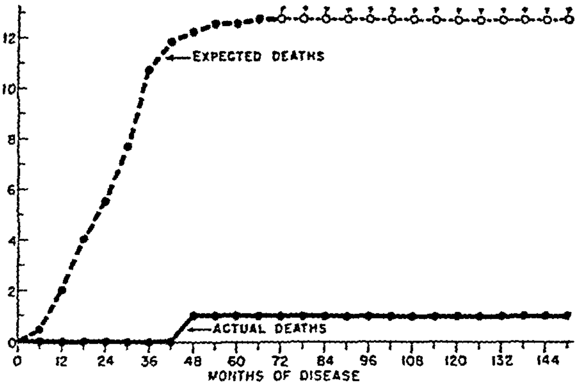

Fig. 2.—Deaths in 46 patients given prolonged intermittent steroid therapy compared to deaths expected on basis of mortality of control group (circles with question marks indicate data not based on actual experience).

Table 2.—*Therapeutic Results in Patients with Nephrosis—Data from Group with No Steroid Therapy Compared to That from Group on Steroid Therapy When Edema Was Noted*

	Control Group*							Steroid Group					
Period, Mo.	No. at Start		Died		Withdrew		Death Rate, %	No. at Start	Entered	Died	Withdrew	Death Rate, %	Deaths Expected, No.
0- 5	35 64	99	0 1	1	3 0	3	1.2		60	2	6	3.5	0.68
6-11	32 63	95	2 2	4	5 20	25	4.9	52	16	5	7	8.8	2.77
12-17	25 41	66	2 3	5	7 5	12	8.4	56	9	5	5	8.6	4.54
18-23	16 33	49	0 2	2	2 4	6	4.4	55	3	4	7	7.5	2.51
24-29	14 27	41	1 2	3	0 2	2	7.5	47	2	5	6	1.1	3.37
30-35	13 23	36	0 1	1	2 2	4	2.9	38	3	5	5	1.4	1.07
36-41	11 20	31	0 1	1	1 2	3	3.4	31	1	2	4	7.1	1.00
42-47	9 18	27	0 1	1	0 0	0	3.7	28	0	0	5	0	0.57
48-53	9 17	26	0 0	0	2 0	2	0	21	0	1	3	5.0	0.00
54-59	7 17	24	0 0	0	0 3	3	0	17	0	0	4	0	0.00
60-65	7 14	21	0 0	0	2 2	4	0	13	1	1	4	8.3	0.00
Totals				18						30			16.81

* Lower figures from Riley.[4] None entered during interval in control group

The control group of 185 cases may not be statistically sufficient to represent a universal picture of the course of this disease. The limitation in time, however, between the years 1946 and 1951, makes it difficult if not impossible to collect a much larger control group. In addition, the well-known high mortality rate, often quoted as 35 to 50%, compared to the one death occurring in 46 treated patients makes such statistical evaluation almost unnecessary.

As described above, the control series comprised two groups of patients: (1) those who received no hormone therapy and (2) those who received hormones only when edema was observed. It is interesting to note (table 2) that the latter group had a statistically significant increase in mortality over the untreated group. We are inclined to believe that the reason for this lies in the fact that patients with severer cases were treated with steroids, while those who seemed initially to have a better prognosis were not so treated.

All patients in the treated group ultimately showed diuresis, although a number required several courses of ACTH therapy, as described above. At present, all are free from edema. In four instances, when all other attempts to induce diuresis failed, intravenous therapy with ACTH resulted in complete diuresis.

There was restoration of normal blood chemistry values (protein, blood urea nitrogen, and cholesterol levels) in all but two patients; one was the only patient in the group who died, and the other is an adult with preuremia and a proteinuria value of 3+. Twenty-five patients have no residual proteinuria, and 19 patients have a trace to 1+ of protein in the urine at the time of writing. Persistent proteinuria seems to occur much more frequently in those patients whose treatment began more than six months after the onset of symptoms. Of patients who were started on maintenance therapy after disease existed for less than six months, 20 showed no proteinuria and 5 a trace to 1+ protein in urine. Of those treated when disease had existed for more than six months, 5 showed no proteinuria, 14 a trace to 1+, and one 3+ (uremia also present). One patient in this latter group died.

A second factor that appears to influence residual proteinuria is the presence of distinct nephritic features (persistent hematuria, granular casts, and elevation of blood pressure) at the start of therapy. There were nine such patients included in this study. The patient who died and the patient with preuremia both had these nephritic features. The remaining seven patients fall into the group with a residual proteinuria value of 1+.

Treated patients were hospitalized only until the completion of diuresis and for the first maintenance course. Thereafter, they were treated as outpatients. Untreated patients who did not die during the first year were hospitalized for an average period of 57 days during each year of observation.

Edema recurred within two to three days after such diseases as upper respiratory infections and exanthem. This occurred in the early phases of our studies when we employed maintenance therapy for shorter periods of time. When the patient was treated promptly with a full course of steroid therapy (12-21 days), such recurrences yielded more readily than the initial episode. In two instances after a second injection of gamma globulin, in one case two days after an injection of Salk poliomyelitis vaccine,[5] and in one case three days after a DPT booster injection, recurrence of edema was observed. Whether immunization procedures with resultant antibody reaction may be hazardous in persons in remission from nephrosis should be studied further.

The growth and development of these children has remained within normal limits during and after prolonged intermittent maintenance therapy.[6] Continuous steroid therapy, in contrast, has resulted in marked developmental disturbances.[7] Prolonged intermittent steroid therapy not only resulted in an improved prognosis but also permitted the patients to live a more gainful and happy life.

No serious adverse side-effects have been noted after prolonged intermittent steroid therapy. Some patients developed moderate elevation of blood pressure (20-30 mm. Hg), both systolic and diastolic, during therapy; this returned promptly to normal values after cessation of maintenance therapy. There was frequently a marked increase in appetite.

A number of our treated patients would probably have experienced spontaneous remissions. Our results, however, and those of other investigators using this regimen,[8] suggest that, for the present, it be followed in all patients with nephrosis. Other regimens,[9] particularly those with smaller hormone dosages, did not lead to equally favorable results. Smaller dosages must, therefore, be considered inadequate from the standpoint of therapeutic effectiveness in the treatment of nephrosis.

Summary

The results of a seven-year study on 46 patients (35 children and 11 adults) with nephrosis who were on a specific regimen of intermittent steroid therapy for a prolonged period showed that the mortality of the treated group was reduced from an expected 12.8 deaths to 1. Furthermore, the patients in the treated group have been able to carry on the normal activities of daily living.

Growth and development were not impaired during or after prolonged intermittent steroid therapy. At present, this regimen, with use of high doses, is recommended for all patients with nephrosis.

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Drs. Ruth Strang, Felix Schwartz, Fritz Blumenthal, and Jerome Noble provided clinical assistance in this study.

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References

1. Farnsworth, E. B.: Acute and Subacute Glomerulonephritis Modified by Adrenocorticotropin, Proc. Soc. Exper. Biol. & Med. **74**:57-59 (May) 1950. Barnett, H. L., and

others: Effect of Adrenocorticotrophic Hormone on Children with Nephrotic Syndrome: II. Physiologic Observations on Discrete Kidney Functions and Plasma Volume, J. Clin. Invest. **30**:227-235 (Feb.) 1951. Metcoff, J.; Kelsey, W. M.; and Janeway, C. A.: Nephrotic Syndrome in Children: Interpretation of Its Clinical, Biochemical, and Renal Hemodynamic Features as Variations of Single Type of Nephron Disease, ibid. **30**:471-491 (May) 1951.

2. Lange, K., in Nephrotic Syndrome, edited by J. Metcoff, New York, the National Nephrosis Foundation, Inc., 1951, pp. 16-24.

3. Lange, K.; Strang, R.; Slobody, L. B.; and Wenk, E. J.: Treatment of Nephrotic Syndrome with Steroids in Children and Adults, A. M. A. Arch. Int. Med. **99**:760-770 (May) 1957.

4. Riley, C., in Proceedings of Sixth Annual Conference on Nephrotic Syndrome, edited by J. Metcoff, New York, National Nephrosis Foundation, Inc., 1955, pp. 227-229.

5. Gavsie, W. H.: Personal communication to the authors.

6. Gribitz, D., in Proceedings of Eighth Annual Conference on Nephrotic Syndrome, edited by J. Metcoff, New York, National Nephrosis Foundation, Inc., 1957. Reference 3.

7. Sobel, E.: Influence of Testosterone and Cortisone on Growth, in Adrenal Function in Infants and Children, edited by L. I. Gardner, New York, Grune & Stratton, Inc., 1956, pp. 137-156.

8. Piel, C. F., and William, G. F.: Long-Continued Adrenal Hormone Therapy in Childhood Nephrosis, J. Am. M. Women's A. **12**:273-279 (Sept.) 1957. Pachioli, R., and Cheli, E.: La terapia corticosurrenale della nefrosi lipoidea nell'infanzia, Clin. Terap. **12**: no. 4-6, pp. 3-163 (April, May, June), 1957.

9. Goodman, H. C., and Baxter, J. H.: Nephrotic Syndrome: Clinical Observations on Therapy with Prednisone and Other Steroids, J. A. M. A. **165**:1798-1808 (Dec. 7) 1957. McCrory, W. W., in Proceedings of Seventh Annual Conference on Nephrotic Syndrome, edited by J. Metcoff, New York, National Nephrosis Foundation, Inc., 1956, p. 210.

ACUTE CLINICAL EFFECTS OF PENETRATING NUCLEAR RADIATION

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The experience at Hiroshima and Nagasaki can be correlated with clinical information from other sources (reactor accidents, exposures to radioactive fall-out, and experience with patients undergoing radiotherapy) to predict some of the hospitalization needs of a population in the event of a nuclear holocaust. Victims can be classified as to the form of acute radiation syndrome they manifest, whether cerebral, gastrointestinal, or hematopoietic. Deterioration is fastest, the prognosis worst, and hospitalization least helpful in patients with the cerebral form. The hematopoietic form, by contrast, has a latent period of about three weeks between recovery from the prodromal sickness and onset of the leukopenia and hemorrhage; the prognosis is best and hospitalization most likely to be effective. The gastrointestinal form is intermediate as to duration of latent interval, likelihood of recovery, and effectiveness of hospital care. The hematopoietic form of acute radiation sickness is likely to pose the major problem. The height of hospital occupation then should be reached during the fifth and sixth weeks after exposure, and medical authorities will probably have sufficient time to plan the necessary countermeasures.

In crossing the threshold to the age of nuclear power and space conquest, mankind again experiences the eternal tragedy of ambivalence of its finest technical achievements; they may be applied either in peace, to accelerate general progress and prosperity, or in war, to enhance general destruction and misery. Although it is impossible to foresee the entire complexity of medical problems created by a nuclear holocaust, some basic conditions can be anticipated and must be understood by military as well as civilian physicians.

Historical Development

In both Hiroshima and Nagasaki, the atomic bombs were exploded about 2,000 ft. above the center of the city. At the point of detonation a temperature of several million degrees developed and instantaneously vaporized fission products, unsplit fissionable material, and other parts of the weapons. These highly luminous and radioactive gases, forming the "fireball," quickly ascended into the troposphere where they were cooled, condensed, and dispersed. The city area underneath the explosion, therefore, was essentially affected by only three factors—shock wave, heat originating from the sunlike fireball, and the initial gamma and neutron radiation. Destruction by blast and fire predominated to such a degree that types and distribution of casualties corresponded closely to those seen

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after large-scale bombing raids with conventional explosives; ionizing radiation was a minor complicating factor.[1]

If "altitude air burst"—as executed in the case of the Japanese cities—could be conceived of as the prototype for future warfare, some complacency might be justified. It is one problem to shoot a ballistic missile over a distance of many thousand miles, but it is another problem to hit the target within several thousand feet. Grounds for any such complacency, however, were completely destroyed by the explosion of the thermonuclear bomb at Bikini in March, 1954. This "surface burst" drew general attention to a fourth injurious factor—residual nuclear radiation emitted by fall-out material—and dramatically demonstrated by accidental exposure of several hundred persons that fall-out might become the bomb effect of greatest medical concern.[2] In this surface burst the fireball touched ground and immediately vaporized thousands of tons of soil that were transformed into highly radioactive material by the intense neutron flux. As the fireball rose, it caused high winds at the earth's surface and thereby sucked up additional dust and debris. This huge cloud of activated or contaminated material was carried away by the winds at high altitude, and its radioactive particles descended as "fall-out" on the underlying region, where they continuously emitted penetrating ionizing radiation.

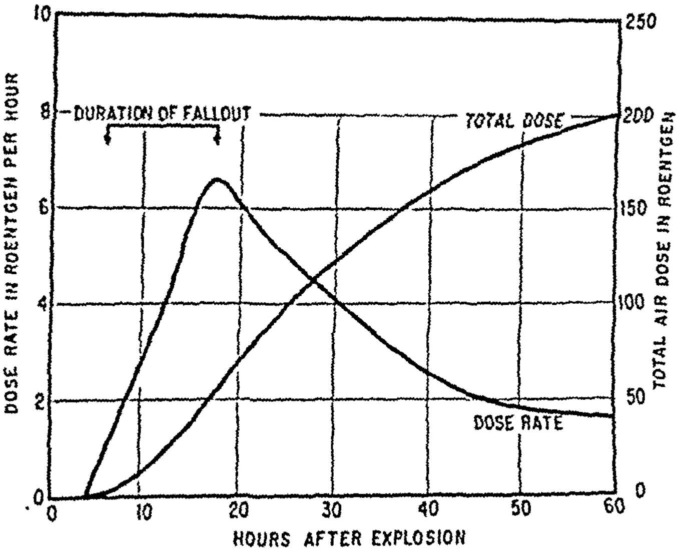

Fig. 1.—Time dependency of dose rate and accumulated air dose at 120 miles downwind from a hypothetical nuclear surface burst. Wind velocity is approximately 30 mph.

As shown in figure 1, the accumulated dose continued to rise with progressing time, although the dose rate, after passage of the cloud, declined because of the decay of radioactivity. Obviously, in the cities and on the air bases engulfed in such a fall-out pattern, military and civilian physicians would face disaster problems and casualties of a type quite different from those in Hiroshima and Nagasaki. Owing to the absence of blast and heat, penetrating ionizing radiation would be the outstanding casualty-causing agent and would produce clinical pictures unfamiliar to most practitioners. The following question would then be of paramount importance:

Is it possible, from the accumulated air dose, to predict type, degree, time course, and incidence of the ensuing disease in a large population and thereby to estimate the medical requirements—personnel, hospital beds, and supplies?

Source of Information

An attempt to answer this question can be based on four sources of information: atomic bomb casualties, nuclear accidents, radiotherapy, and animal experiments. In approximately 10% of the Japanese bomb casualties, initial ionizing radiation was the dominating injurious factor; however, clinical and pathological data cannot safely be related to a corresponding dose, since the intensity pattern of neutron and gamma radiation is largely unknown for the two Japanese cities.[3] About 300 persons have been accidentally exposed to appreciable amounts of nuclear radiation from fall-out or fissionable material; again, the medical findings can only be loosely referred to a specific dose because of the difficulty of estimating radiation intensity after the actual event has passed. Radiotherapy has accumulated a wealth of experience about radiation effects on man. Although only limited portions of the body are exposed as a rule, relatively high doses of whole-body irradiation have been administered occasionally.[4] These observations are particularly important because they represent the only human data with accurately known quality and quantity of radiation. Since radiation effects are of a surprisingly uniform nature throughout the entire mammalian kingdom, large-scale animal experiments are of considerable assistance in understanding the frequently sporadic findings on human beings. In transferring animal observations to man, however, great caution must be exercised, owing to the fact that certain features, especially the speed with which the clinical picture unfolds, are highly characteristic for a given species.

Obviously, each of the four information sources is compromised; the dose may be ill-defined, the subject may be a seriously sick patient, or extrapolation from animal to man may be required. Thus, the answer to the previous question must necessarily be provisional rather than final. Most of the doses quoted should not be considered as firm values but as the best possible estimates with present-day knowledge. Oversimplified and dogmatic presentation of the complex material derives its justification from the physician's need for a guideline in emergency situations. A more detailed report has been given elsewhere.[5]

General Survey and Terminology

Although widely differing in physical nature (neutrons, high-speed beta particles, and gamma or roentgen photons) and origin (atomic bomb, nuclear reactor, cosmos, and therapeutic x-ray sources), penetrating ionizing radiations are amazingly uniform and comparable in biological effect. Quite in contrast to mechanical and thermal lesions, for instance, overt clinical signs and symptoms do not follow the radiation insult immediately but are delayed for a characteristic span of time. This "latent period" is explained in part by the fact that ionizing radiation temporarily inhibits mitosis in certain sensitive cell systems with high proliferative activity. After irradiation, the organism continues its normal function until the store of mature critical cells is exhausted (e. g., leukocytes), and only then the disturbance becomes overt because of the lack or deficiency of new cell supply. As a rule, since mitotic damage is only transitory, normal function will be resumed if the organism is able to survive the critical period of maximal cell depression. This point is well illustrated by the fact that radiation-induced sterility, epilation, and leukopenia are generally transitory in nature.

The previous concept leads to the following important statements: Severity of radiation injury is decided by dose and individual susceptibility; contrariwise, time course and speed with which the clinical sequelae unfold are essentially determined by the affected cell system. In short, ionizing radiation triggers in the critical tissue a process that then proceeds according to inherent properties of that biological system. Consequently, for a given dose range, the clinical picture will be characterized by that essential organ which has the shortest latent period.

Although the different organs show a wide diversity with respect to radiosensitivity and latent period, for the present problem only three appear to be important: central nervous system, small intestine, and bone marrow, together with the lymphoid tissue (table 1). To trigger acute clinical sequelae in the central nervous system, a dose of several thousand roentgens is required; however, overt disease will then develop within hours. For the small intestine, the threshold dose lies around 500 r, while the latent period is approximately five days. Finally, for the hematopoietic tissue, the corresponding values are about 100 r and three weeks respectively.

Because of these differences, the following responses will occur: At very high doses (suprathreshold for all three critical organs), central nervous system damage will reveal itself within a few hours after exposure and will lead to a characteristic clinical picture—the cerebral form of the acute radiation syndrome—which proceeds while injury to the other two organs is still latent. At middle doses (suprathreshold for small intestine and bone marrow), gastrointestinal injury will start, several days after exposure, a sequence of overt clinical signs and symptoms—the gastrointestinal form of the acute radiation syndrome—which frequently will run its complete course before the still latent bone marrow damage enters the scene. Finally, at lower doses (suprathreshold for bone marrow and lymphoid tissue alone), the hematopoietic form of the acute radiation syndrome will begin to develop about three weeks after exposure.

In addition to the clinical response of the three critical organs, penetrating ionizing radiation also evokes a transitory systemic reaction of an unspecific character which precedes the actual specific disease. This complex of signs and symptoms should be termed "initial reaction" or "prodromal phase" of the acute radiation syndrome.

Prodromal Phase of Acute Radiation Syndrome

In sharp contrast to the uniformity of the specific organ reactions, the systemic response during the prodromal phase varies strongly in different species. In the rabbit and chicken, it is characterized by severe hypotension that leads, not infrequently, to circulatory collapse and even death. In the mouse and rat, it appears as a brief period of listlessness and apathy. In the dog, monkey, and man, it forms a complex closely resembling seasickness or airsickness. As with these diseases, it is easily influenced by individual disposition and psychological factors. In typical cases the sequence is as follows: Within two hours after exposure, loss of appetite, listlessness, and apathy develop rather abruptly and the patient complains about an "upset stomach." Soon, nausea and frank vomiting appear and increase in intensity until they reach their maximal height around eight hours after irradiation. At this time, profuse vomiting not infrequently leads to extreme weakness and even prostration. Thereafter, the distress recedes as fast as it developed. On the second day, nausea and occasional vomiting still persist but the general condition is markedly improved; on the third day, all discomfort has completely subsided. It should be emphasized that the degree of illness depends very much on individual disposition; the same dose that causes incapacitating prostration in one patient may be followed by only

TABLE 1.—*Effects of Penetrating Ionizing Radiation on Man—Schematic Survey*

	Acute Radiation Syndrome, Form		
	Cerebral	Gastrointestinal	Hematopoietic
Determining organ	Central nervous system	Small intestine	Bone marrow
Threshold dose, r	2,000	500	100
Latent period .	½-3 hr	3-5 days	3 wk.
Characteristic signs and symptoms . ..	Lethargy, convulsions, ataxia	Diarrhea, fever, disturbance of electrolyte balance	Leukopenia, purpura, infection
Underlying pathology	Inflammatory reactions in central nervous system, brain edema	Denudation of gastrointestinal mucosa	Atrophy of bone marrow
Time of death (if occurring) .	Within 2 days	Within 2 wk.	Within 2 mo.
Cause of death .	Respiratory arrest	Circulatory collapse	Hemorrhage, generalized infection
Prognosis	Hopeless	Poor	Good
Source of information ..	Animal experiments	Animal experiments, bomb casualties, nuclear accidents	Bomb casualties, nuclear accidents, radiotherapy

light episodes of nausea in another.[4] For this reason, severity of the prodromal phase is not necessarily indicative of the seriousness of the ensuing specific organ reaction.

Mild forms of the prodromal phase can be handled by psychological reassurance, with emphasis on the ephemeral character of the distress. More serious forms may require sedatives, such as chlorpromazine hydrochloride, and occasionally the need may arise for parenteral fluid supply to replace the loss caused by profuse vomiting.

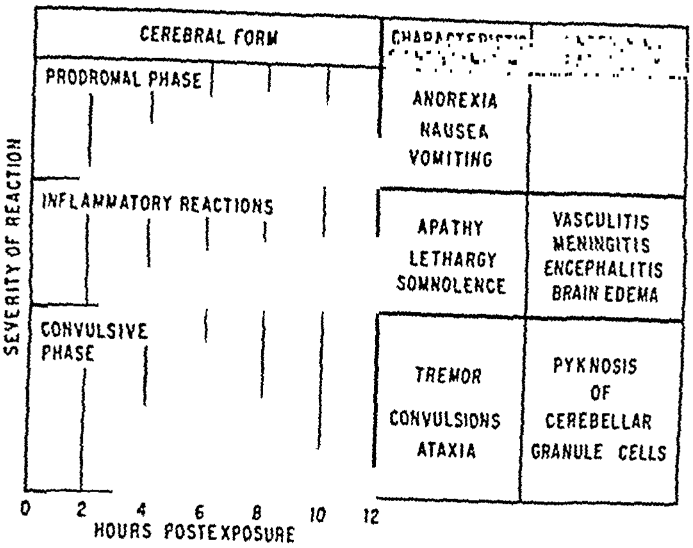

Fig. 2.—Schematic drawing of three components that merge in clinical picture of cerebral form of acute radiation syndrome.

Cerebral Form of Acute Radiation Syndrome

In Hiroshima and Nagasaki the few persons who received doses of several thousand roentgens without suffering from lethal mechanical and thermal injuries were lost during the confusion of the first three days after attack, and only vague reports are available about the cerebral form of the disease in man. Therefore, the clinical picture must be extrapolated from animal experiments. This can be done with a high degree of confidence, since there exists close agreement between species.[6]

The clinical picture can be conceived as the composition of three separate processes (fig. 2). In the manner described before, the prodromal phase starts to develop; but soon a second component is added, the characteristic manifestations of which swiftly progress from listlessness, drowsiness, and languor to severe apathy, prostration, and lethargy. With high probability the morphologic changes responsible for this development are nonbacterial inflammatory infiltrations that appear in small foci widespread throughout the entire central nervous system within one to two hours after exposure. This radiation-induced vasculitis, meningitis, or encephalitis is associated with a disturbance of the blood-brain barrier, leading to brain edema. After doses in excess of 5,000 r, the clinical picture shows a third component, characterized by seizures ranging from generalized muscle tremor to epileptoid convulsions of the grand mal type. This convulsive phase of a few hours' duration is then followed by ataxia, pointing to a vestibulocerebellar disturbance. Convulsions and ataxia, most likely, are consequences of pyknosis developing in the granule cell layer of the cerebellum within two hours after exposure.

Whole-body exposure to doses causing the cerebral form always leads to death. Since heavy sedation prevents seizures in animal experiments, its therapeutic trial seems to be indicated.

Gastrointestinal Form of Acute Radiation Syndrome

Among the Japanese bomb casualties, the gastrointestinal form had terminated its course in the majority of cases before the time when orderly hospital facilities had been restored and clinical records could be kept. And, among persons involved in nuclear accidents, only a few were unfortunate enough to receive a dose capable of causing this form. From the scanty human observations, supplemented by findings made in animal experiments,[7] the typical clinical picture emerges as follows (fig. 3).

On the third day after exposure, when manifestations of the prodromal phase have subsided, the patient's physical and mental condition appears encouraging in outlook. That this favorable state is deceptive and that the latent period is brief are revealed by the sudden onset of the specific disease, starting around the fifth day. Rather abruptly, malaise, anorexia, nausea, retching, and vomiting recur and compromise normal food and fluid uptake. Simultaneously, high fever and persistent diarrhea (rapidly progressing from loose to watery to bloody stools) appear. The abdomen is distended, and peristaltic movements cannot be detected. Rapid deterioration of the patient's general condition soon leads to the clinical picture of severe paralytic ileus. During the second week after exposure, circulation begins to falter, dehydration and hemoconcentration develop, and, finally, the patient becomes comatose and dies in circulatory collapse.

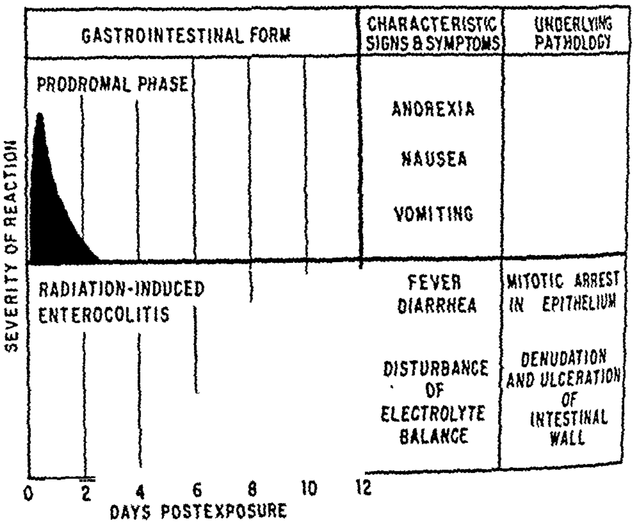
GASTROINTESTINAL FORM
CHARACTERISTIC SIGNS & SYMPTOMS
UNDERLYING PATHOLOGY
PRODROMAL PHASE
ANOREXIA
NAUSEA
VOMITING
RADIATION-INDUCED ENTEROCOLITIS
FEVER
DIARRHEA
DISTURBANCE OF ELECTROLYTE BALANCE
MITOTIC ARREST IN EPITHELIUM
DENUDATION AND ULCERATION OF INTESTINAL WALL
SEVERITY OF REACTION
0
2
4
6
8
10
12
DAYS POSTEXPOSURE

Fig. 3.—Schematic drawing of two components that merge in clinical picture of gastrointestinal form of acute radiation syndrome.

The morphologic substrate behind the clinical picture is located in the small intestine, particularly in the duodenum and jejunum. Normally, the mucosal epithelium that covers the villi is continuously sloughed off into the alimentary tract and is replenished by new cells originating in the generative centers of the crypts. Doses in excess of 500 r inhibit or arrest mitosis in these centers and thereby prevent replacement of desquamated epithelium. As a consequence, denudation of the inner intestinal wall develops, which, in turn, leads to loss of water, electrolytes, and leukocytes. Moreover, absence of epithelium means absence of the barrier against invasion by toxic substances and bacteria. Inflammatory reactions and ulcerative lesions, therefore, are common findings (radiation-induced enterocolitis).

Therapeutic management of the disease, according to Cronkite,[8] has to proceed along the following main lines: Intravenous nutrition, as well as maintenance of water and ionic balance, must be attempted by the supplying of large amounts of electrolytes, plasma, vitamins, and saline-glucose solution. With the onset of fever, expected to occur about five days after exposure, intensive antibiotic treatment should be started. Hemorrhage, anticipated during the second week, will require transfusions of whole blood. Excellent nursing care and aseptic technique are essential.

Hematopoietic Form of Acute Radiation Syndrome

Among the Japanese bomb casualties, the hematopoietic form of the disease has been registered in numerous cases; it was latent during the disastrous conditions of the first weeks after attack, and its overt clinical manifestations appeared at the time when medical care and recording began to return to normal. In addition, clinical histories are available for several hundred persons accidentally exposed to nuclear radiation and for a similar number of radiotherapy patients treated with relatively large doses of x-ray to the whole body. Thus, the disease is well documented for man, and its typical clinical picture is rather firmly established (fig. 4).

On the third day after exposure, when prodromal effects have vanished, the patient becomes asymptomatic and capable of resuming his normal occupation. Although increased fatigability may be present in a few patients, fitness to endure even strenuous physical activity is the rule. This latent period, during which the patient enjoys apparently normal health, may extend to the 19th or 20th day after irradiation, when it ends rather abruptly. As in the acute onset of an infectious disease, the patient experiences chills, malaise, a feverish feeling, headache, fatigue, and shortness of breath on exertion. Within a few days, the general condition deteriorates so markedly as to necessitate hospitalization. Complaints point to a "sore throat," and examination of the oral cavity reveals pharyngitis with swelling, particularly of the gingiva and tonsils. Soon the picture is further aggravated by bleeding from the gums and by ulcerative lesions showing a predilection for the gingiva and tonsils. Concomitant with these processes in the oral cavity, high fever develops, while petechiae and/or ecchymoses appear in the skin. During the fifth and sixth weeks after exposure, this picture of an "agranulocytotic disorder" or an "aplastic anemia" reaches its point of culmination and the patient passes through a critical phase. Thereafter, recovery starts; fever, petechiae, and ecchymoses disappear; and the ulcerative lesions heal. Convalescence begins around the end of the second month after exposure, fitness for resuming normal work is restored about one month later.

The causative substrate behind the clinical picture is mitotic inhibition or arrest occurring in the hematopoietic system. When the store of mature blood cells is exhausted, damage to bone marrow, spleen, and lymphoid tissue reveals itself as pancytopenia. Reflecting the clinical course, white blood cell and thrombocyte counts reach their lowest point during the fifth and sixth weeks after exposure and then gradually return toward normal values. The red blood cell count is much slower in falling and recovering.

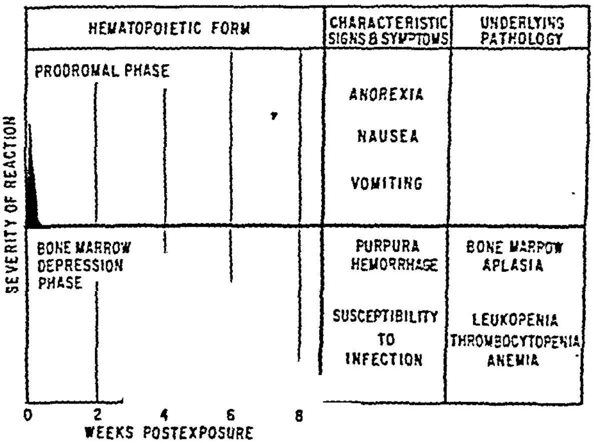

Fig. 4.—Schematic drawing of two components that merge in clinical picture of hematopoietic form of acute radiation syndrome.

Since no specific therapy has been developed as yet, complications must be treated as they arise. Purpura and frank hemorrhage require repeated transfusions of fresh whole blood or separated platelets and leukocytes, the frequency and amount of transfusions being determined by the blood cell count. It may be worthwhile to try additional procedures usually applied in other types of agranulocytic disorders. Administration of broad-spectrum antibiotics is necessary to combat localized infections and to prevent their generalization. Under proper management, outcome of the hematopoietic form is predominantly favorable because of the bone marrow's tendency for spontaneous recovery.

Transition Forms

For didactic reasons, the three forms of the acute radiation syndrome have been described as completely independent entities. In reality, these clinical pictures will be separated from each other by broad dose ranges exhibiting a mixture between two adjacent pure forms. Of these transition pictures, that between the gastrointestinal and hematopoietic forms is particularly important for two reasons: first, its incidence among the Japanese bomb casualties is high; second, its therapeutic management may be crowned by success. When damage to the small intestine is relatively mild, the patient lives long enough to show overt signs of bone marrow depression. On the typical gastrointestinal picture is then superimposed severe pancytopenia with purpura and frank hemorrhage appearing during the second week; apparently, their onset is strongly accelerated by heavy losses of leukocytes into the inflamed alimentary tract. This hematopoietic form with gastrointestinal involvement, or gastrointestinal form with hematopoietic complications, frequently has been presented as the "typical radiation disease."

TABLE 2.—*Interrelations Between Dose Level and Clinical Picture*

Dose Range, Roentgens	Source of Information	Signs and Symptoms	Clinical Course
15-50	3 volunteers, 4 nuclear reactor accidents, 157 fall out exposures, numerous radiotherapy patients	No prodromal phase, slight transient lymphopenia, otherwise asymptomatic	Trivial
50-100.....	2 nuclear reactor accidents, 46 fall out exposures, about 40 radiotherapy patients	Prodromal phase in 5% of cases, slight leukopenia, otherwise asymptomatic	Trivial
100-150.....	1 nuclear reactor accident, about 20 radiotherapy patients	Prodromal phase in 30% of cases, mild leukopenia	Mild, ambulatory
150-200.....	3 nuclear reactor accidents, 64 fall-out exposures, about 40 radiotherapy patients	Prodromal phase in 70% of cases, definite leukopenia	Mild, ambulatory
Hospitalization Threshold			
200-400.....	1 nuclear reactor accident, 23 fall-out exposures (Japanese fishermen)	Fully developed hematopoietic form	Moderate to grave
400-600.....	3 nuclear reactor accidents	2 hematopoietic forms 1 gastrointestinal transition form	Grave Lethal

Dose Dependency of the Hematopoietic Form

The hematopoietic form and the corresponding dose range deserve special attention for several reasons: first, fall-out radiation from 15 to 500 r probably will cover the largest land area by far; second, as analyzed by Meyer,[9] many emergency situations may arise in this atomic age which may force military as well as civil defense personnel to accept doses capable of eliciting the disease; and third, as demonstrated by numerous successfully treated cases, this form promises to reward the physicians' efforts. For an exposed population, medical authorities must base estimate of, and preparation for, the ensuing disease on the air dose when it is known (table 2) or on early signs and symptoms when the dose is unknown (table 3).

With the reservation that the quoted values are only guidelines, and with the understanding that the dose actually received by a population will be highly uncertain under emergency conditions, the contents of table 2 can be briefly summarized as follows: Doses below 100 r are of no acute concern to the physician and will require no treatment other than psychological reassurance. In the dose range from 100 to 200 r, about 50% of the population will experience mild degrees of prodromal effects and hematopoietic depression that can be watched and treated on an ambulatory basis. A dose level in the neighborhood of 200 r must be defined as the hospitalization threshold, since beyond this point the full-blown hematopoietic form will appear with all its complications and will show an incidence among the population which will rapidly grow with the dose. This hospitalization threshold is a concept important for medical organizations and logistics. The subthreshold range generally requires nothing but psychological reassurance and precautionary blood cell counts, whereas the suprathreshold range necessitates arrangements for hospital facilities, personnel, and supplies. Between 200 and 400 r—perhaps even 500 r—the typical, fully developed hematopoietic form of the disease must be anticipated. Mortality of this form was 50% at the improvised facilities of Hiroshima and Nagasaki; it was 30% at the University of Tokyo; and it is expected to be further reduced at modern hospital establishments. Since the dose range beyond 400 r is poorly documented for man, definite statements

TABLE 3.—*Interrelations Between Clinical Picture and Dose Level*

Signs and Symptoms	Dose Indicated Roentgens	Clinical Course Expected
Nausea and vomiting		
Absent	Less than 100	Trivial
Present	More than 100	Surveillance needed
Latent phase		
Less than 2 wk.	More than 400	Gastrointestinal complications
More than 2 wk.	Less than 400	Typical hematopoietic form
Fever		
After 20 days	Less than 400	Typical hematopoietic form
Within 2 wk.	More than 400	Gastrointestinal involvement
Epilation		
Absent	Less than 300	Typical hematopoietic form
Present	More than 300	Possible gastrointestinal involvement
Persistent diarrhea		
Absent	Less than 400	Typical hematopoietic form
Present	More than 400	Gastrointestinal form
Leukopenia		
WBC above 2,500/cu.mm.	...	Mild hematopoietic form
WBC between 2,500 and 1,000/cu.mm.	...	Moderate hematopoietic form
WBC below 1,000/cu.mm.	...	Grave hematopoietic form
Lymphopenia within 48 hr.		
Slight	Less than 50	Trivial
Mild	Less than 100	Trivial
Lymphocytes less than 50% of normal values..	More than 100	Surveillance needed

are precluded; however, it is rather certain that, with increasing dose, gastrointestinal involvement will pose a growing problem and will significantly cloud prognosis. Currently available data are insufficient either to support or to contradict the assumption that an acute exposure to 600 r is the highest one compatible with human survival. For further information, attention is drawn to several interesting monographs.[10]

Incidence and Duration of Hospitalization

Susceptibility to ionizing radiation varies widely among individual members of a population exposed to the same dose. It must be emphasized, however, that such variation affects only the severity of the ensuing disease, not its characteristic time course. This statement, important to medical logistics, is underlined by figure 5. The course over time of the white blood cell count is based on large groups of Hiroshima survivors, whereas the doses have been estimated from therapeutic or nuclear radiation data and from animal experiments. Figure 5 clearly demonstrates that, independent of dose, maximal leukopenia occurs around the fifth week after exposure; consequently, severity of disease and incidence of hospitalization will culminate at this critical period. Owing to its characteristic progression, the hematopoietic form will result in a specific pattern in the need for hospitalization (fig. 6). Although based on all human data presently available, the values in figure 6, of course, are still highly conjectural in nature; however, several points essential to military and civil defense planning appear to be rather firmly established. First, existence of a latent period of two to three weeks' duration will allow medical authorities sufficient time to prepare necessary countermeasures; second, the height of hospital occupation will be reached during weeks five and six after exposure; and, third, appreciable numbers of patients can be released after the second month after exposure.

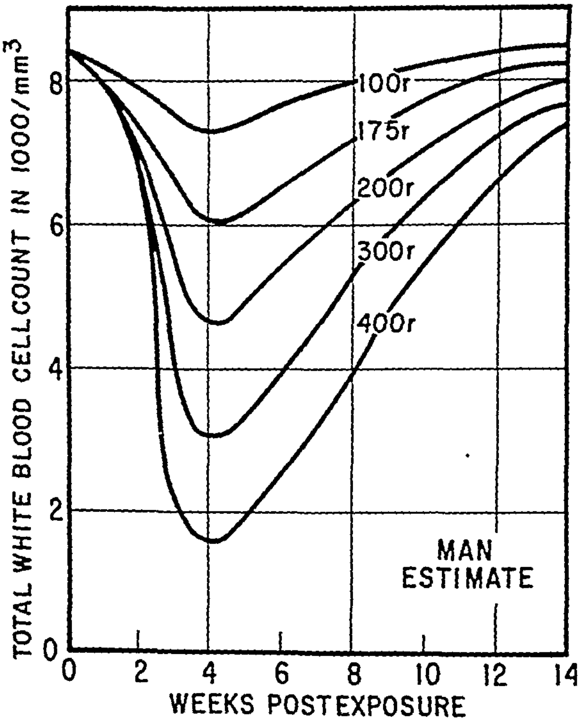

Fig. 5.—Effect of various doses of penetrating ionizing radiation on white blood cell count of man, represented is estimate of mean values for large populations.

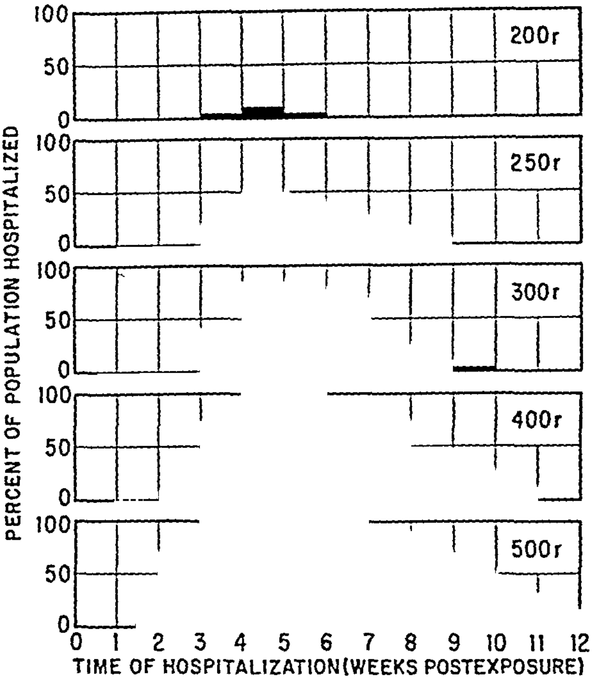

Fig. 6.—Estimate of incidence and duration of hospitalization for populations exposed to various doses of penetrating ionizing radiation.

As in any other severe disease, the acute radiation syndrome may be followed by delayed complications. Induction of leukemia, cataract, or neoplasm has been observed in a relatively small percentage of Hiroshima and Nagasaki survivors. However, the overwhelming majority among both Japanese bomb casualties and persons exposed to nuclear radiation have regained normal health and fitness to pursue their former occupations with full vigor.

Summary

Based on comparative analysis of data derived from radiotherapy patients, persons involved in nuclear accidents, Japanese bomb casualties, and animal experiments, the clinical picture of the acute radiation syndrome is described with its three subdivisions: cerebral, gastrointestinal, and hematopoietic forms. Signs and symptoms are dependent on dose level and individual susceptibility. The hematopoietic form of the disease will probably pose the major problem facing the physician under catastrophic conditions. Some basic rules for medical radiation defense planning are, therefore, de-

rived from the typical time course of the hematopoietic form of the acute radiation syndrome.

Route 3, Box 512 C.

References

1. Oughterson, A. W., and Warren, S.: Medical Effects of Atomic Bomb in Japan, New York, McGraw-Hill Book Co., Inc., 1956. Liebow, A. A.; Warren, S.; and DeCoursey, E.: Pathology of Atomic Bomb Casualties, Am. J. Path. **25**:853-1027 (Sept.) 1949.

2. Glasstone, S.: *Effects of Nuclear Weapons, AFP 136-1-3*, published by the U. S. Atomic Energy Commission in cooperation with the U. S. Department of Defense, June, 1957. Cronkite, E. P.; Bond, V. P.; and Dunham, C. L.: Some Effects of Ionizing Radiation on Human Beings: Report on Marshallese and Americans Accidentally Exposed to Radiation from Fallout and Discussion of Radiation Injury in Human Beings, U. S. Atomic Energy Commission, July, 1956.

3. Wilson, R. R.: *Nuclear Radiation at Hiroshima and Nagasaki*, Radiation Res. **4**:349-359 (May) 1956.

4. Miller, L. S.; Fletcher, G. H.; and Gerstner, H. B.: *Radiobiologic Observations on Cancer Patients Treated with Whole-Body X-Irradiation*, Radiation Res. **8**:150-165 (Feb.) 1958.

5. Gerstner, H. B.: Military and Civil Defense Aspects of *Acute Radiation Syndrome* in Man, Research Report 58-6, *Air Force School of Aviation Medicine*, November, 1957.

6. Gerstner, H. B., and Kent, S. P.: Early Effects of Head *X-Irradiation in Rabbits, Radiation Res.* **6**:626-644 (June) 1957. Vogel, F. S.; Hoak, C. G.; Sloper, J. C.; and Haymaker, W.: Induction of Acute Morphological Changes in Central Nervous System and Pituitary Body of Macaqu Monkeys by Cobalt 60 (Gamma) Radiation, J. Neuropat & Exper. Neurol. **17**:138-150 (Jan.) 1958.

7. Quastler, H.: Nature of *Intestinal* Radiation Deat *Radiation Res.* **4**:*303-320 (April) 1956*. Conard, R. A *Cronkite, E. P.; Brecher, G.; and Strome, C. P.*: Exper mental Therapy *of* Gastrointestinal Syndrome Produced Lethal *Dose* of Ionizing Radiation, J. Appl. Physiol. **9**:22 233 (Sept.) 1956.

8. Cronkite, E. P.: Treatment of Radiation Injuries, Med. **118**:328-334 (April) 1956.

9. Meyer, A. F., Jr.: *Emergency Radiation* Expos Control: *Development of Criteria, Am. Indust. Hyg.* Quart. **16**:210-214 (Sept.) 1955.

10. Hachiya, M.: Hiroshima Diary, translated and edi by W. Wells, Chapel Hill, N. C., *University of* North Ca lina Press, 1955. Schubert, J., and Lapp, R. E.: Radiati *What It Is* and How It *Affects You, New York, the* Vik Press Inc., Publishers, 1957. Lapp, R. E.: *Voyage of* Lucky Dragon, *New York, Harper & Brothers*, 19 Schneider, O.: *Survival in Atomic Disaster, in* Ato Medicine, edited by C. F. Behrens, Baltimore, William Wilkins Company, 1953. Sears, T. P.: *The Physician* Atomic Defense, Chicago, Year *Book Publishers*, Inc., 19

NEUROTROPHIC ULCERS OF THE FEET

REVIEW OF FORTY-SEVEN CASES

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Any persistent nonhealing ulcer, particularly when associated with a callus, should alert the clinician to neurotrophism as the cause. Opinion is divided to some degree on the bone and joint changes seen by radiography in patients with neurotrophic lesions of the feet. Roentgenographic changes of a degenerative character in any foot with proved peripheral sensory impairment are indicative of neurotrophic arthropathy. The association of bony proliferation that is meaningless or excessive should further alert the clinician. Periosteal thickening, if affecting a site remote from an ulcer, may be significant. Therapeutic measures include simple curettage, removal of the metatarsal head, toe amputation, and major amputation.

Neurotrophic affections of the feet masquerade under a multitude of names. Terms frequently used are malum *perforans* pedis, perforating ulcer of the foot, melanoderma, familial ulceromutilating acropathy, neurovascular dystrophy, and trophopathia pedis myelodysplastica. Neurotrophic ulcer is perhaps the most descriptive term for this group. According to Jelliffe,[1] Nélaton and Vesigne in 1852 were the first to call attention to this condition. Jelliffe reviewed the history of neurotrophic affections of the feet and the early literature, recording 220 articles on this subject prior to 1894.

Early authors recognized the common denominator as damage to sensation, either peripheral or central in origin. Diabetes complicated by peripheral neuropathy is the most frequent cause of

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such ulcers. Martin[2] in 1954 noted the frequency of neurotrophic disorders of the feet in persons with diabetes. He emphasized the need to recognize this fact and to distinguish these ulcers from those due to infection per se and to occlusive vascular disease.

Myelodysplasia frequently causes neurotrophic ulcers. Jackson[3] discussed errors in the development of the spinal cord and column and expressed the view that cervical and lumbosacral syringomyelia are related entities. Van Epps and Kerr,[4] Lessmann and Poth,[5] and Mulvey and Riely[6] alluded to this close relationship. Whatever the relationship may be, all will agree that both myelodysplasia and syringomyelia are causes of neurotrophic lesions of the feet. Post-traumatic lesions of the cord,[7] tabes dorsalis,[8] and injuries of the sciatic nerve[1] are known causes of neurotrophic ulcers. It is worth noting that tabes is less frequently mentioned in the recent literature.

Opinion is divided to some degree on the bone and joint changes seen by radiography in patients with neurotrophic lesions of the feet. Hodgson and co-workers[9] and Ritvo[10] expressed the belief that changes noted by radiography, attributed to neurotrophism, are in actuality due to infection. In the series of Hodgson and co-workers only 15 of 61 patients had evidence of sensory deficit. Martin[2] contested this view and said that the radiologic appearance of a neurotrophic joint is that of "hypertrophic arthropathy with destruction of the subarticular bone and excessive new bone formation but without periosteal reaction or evidence of bone reabsorption." He has noted such changes without soft-tissue infection or with soft-tissue infection remote to the site of neurotrophic changes in the bones and joints. All of Martin's patients had neuropathy.[11] Changes of a hypertrophic nature without new bone formation can be easily passed over as purely degenerative rather than neurotrophic. Mulvey and Riely[6] have recorded such changes in the first metatarsophalangeal joint, and Martin[2] has recorded them in the midtarsal joint.

TABLE 1.—*Roentgenographic Findings in Forty-seven Patients with Neurotrophic Ulcers*

	Changes, No.				
Cause of Ulcers	Definite	Mixed	Questionable	None	Total
Diabetes	6	6	6	5	23
Myelodysplasia	2	...	1	5	8
Syringomyelia	1	...	2	3	6
Old sciatic nerve injury	...	...	...	2	2
Old spinal cord injury	...	...	1	3	4
Peripheral neuritis in rheumatoid arthritis	...	...	1	...	1
Neuropathy of herpes zoster	...	...	...	1	1
Tabes dorsalis	...	1	...	...	1
Undetermined	...	...	1	...	1
Total	9	7	12	19	47

Little is found in the literature regarding the treatment of neurotrophic ulcers. Adequate diabetic control and the use of orthopedic appliances to prevent weight bearing on the affected site are important.[2] A two-stage operation, with débridement and packing followed by closure, or with healing by second intention, was advised by Kern.[12] According to Martin[2] local surgical treatment, when combined with antibiotic therapy, can very often save a limb. In his experience ulcers under metatarsal heads can be treated by excision of the metatarsal head in many cases; however, a two-stage operation is mandatory. Kulowski and Perlman[8a] said that their results from local surgical measures were disappointing, only 2 of 29 patients receiving lasting benefit; however, these authors reported their results prior to the use of antibiotics and made no mention of using orthopedic appliances to modify weight bearing.

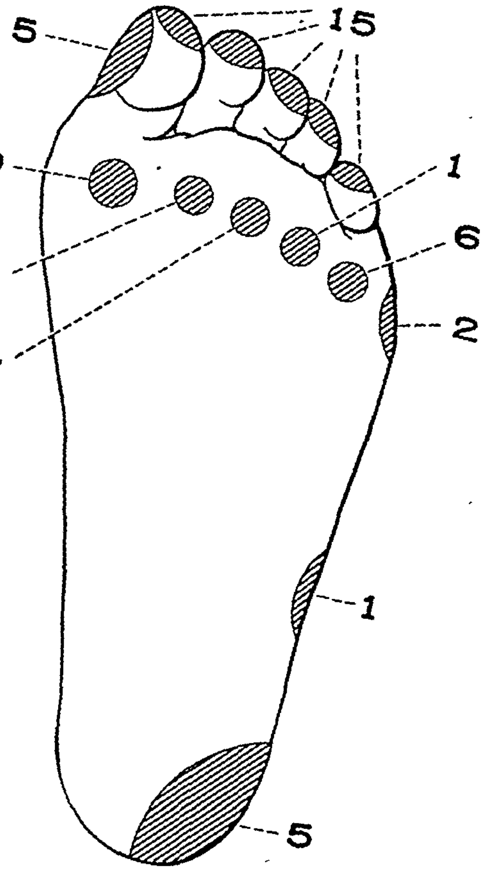

Fig. 1.—Distribution of neurotrophic ulcers in 47 patients. Those on tips of toes were often multiple.

Method of Study

The case records of all patients treated at the Mayo Clinic for neurotrophic ulcers in the period 1946 through 1955 were reviewed; this entailed review of the records of all diabetic patients who had lesions of the feet. Only those diabetics with adequate peripheral circulation, as judged by careful clinical examination, and with evident peripheral neuropathy were included. Follow-up data were obtained in December of 1956 by questionnaire.

ulcers from other causes were evaluated in a similar manner. Evaluation as to whether the ulcer was neurotrophic was usually a combined effort of the sections of peripheral vascular disease, metabolism, neurology, and orthopedics. In this manner, 47 patients with ulcers due to neurotrophic causes were chosen for study.

Findings

The distribution of the cases on the basis of cause of the neurotrophic ulcers is given in table 1. It is seen that diabetic neuropathy was the most frequent cause, while tabes dorsalis accounted for only one case. To our knowledge no other case of neurotrophic ulcer of the foot has been reported after herpes zoster.

Ulcers were most common over the plantar aspect of the foot in the region of the metatarsal heads. The medial aspect of the plantar surface of the hallux, the lateral aspect of the fifth metatarsal head, and the tips of the toes were frequent areas for ulcers. Ulcers on the surfaces of the metatarsal heads were always associated with thick heavy callosities which preceded the appearance of the ulcer.

Figure 1 shows the location of the ulcers on the plantar aspect of the foot. Fifty-nine plantar ulcers were noted in 46 patients; the other patient had an ulcer on the dorsum of the fore part of the foot. Myelodysplastic neurotrophic ulcers were often noted on the tips of the toes. Diabetic neurotrophic ulcers were confined almost exclusively to the region of the metatarsal heads and the medial aspect of the plantar surface of the hallux. Ulcers due to the sequelae of lesions of the cord or cauda equina were common on the heel.

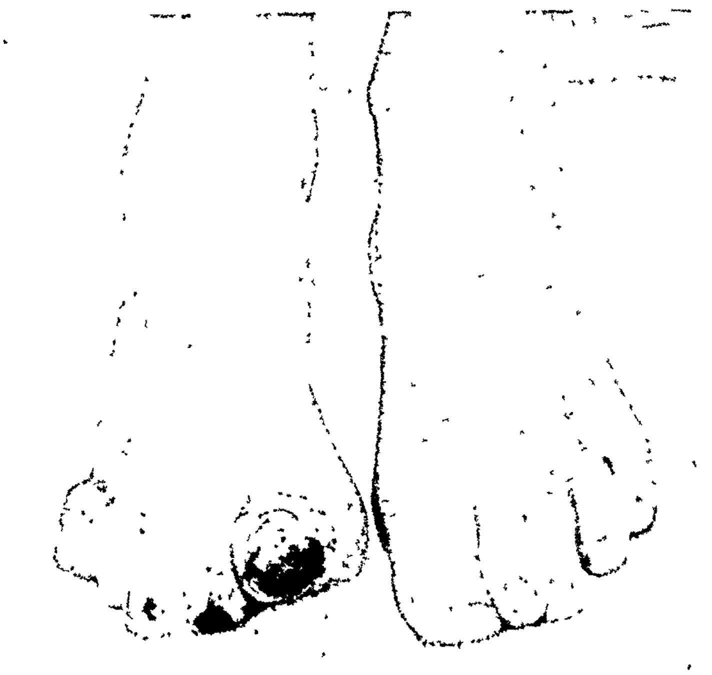

Fig. 2.—Neurotrophic ulcers secondary to myelodysplasia. Note pregangrenous condition of toe.

The distribution of the ulcers indicates a mechanical factor. In reviewing these patients' records one is impressed with the architecture of the patients' feet. A broad, splay, or metatarsus latus type of foot with hammer toes, hallux valgus, and prominent metatarsal heads seemed to be the rule.

Characteristically the ulcer was punched out and circular. It was associated with infection and on occasion a pregangrenous appearance. Figure 2 demonstrates this in a patient with myelodysplasia The presence of strong pedal pulses and normal venous filling time and the resolution of this pregangrenous appearance with conservative management were in sharp contrast to what is observed in patients affected with occlusive vascular disease. Pinch grafts to the great toe resulted in healing in this patient. Such a lesion in an elderly diabetic person could be mistakenly ascribed to occlusive vascular disease.

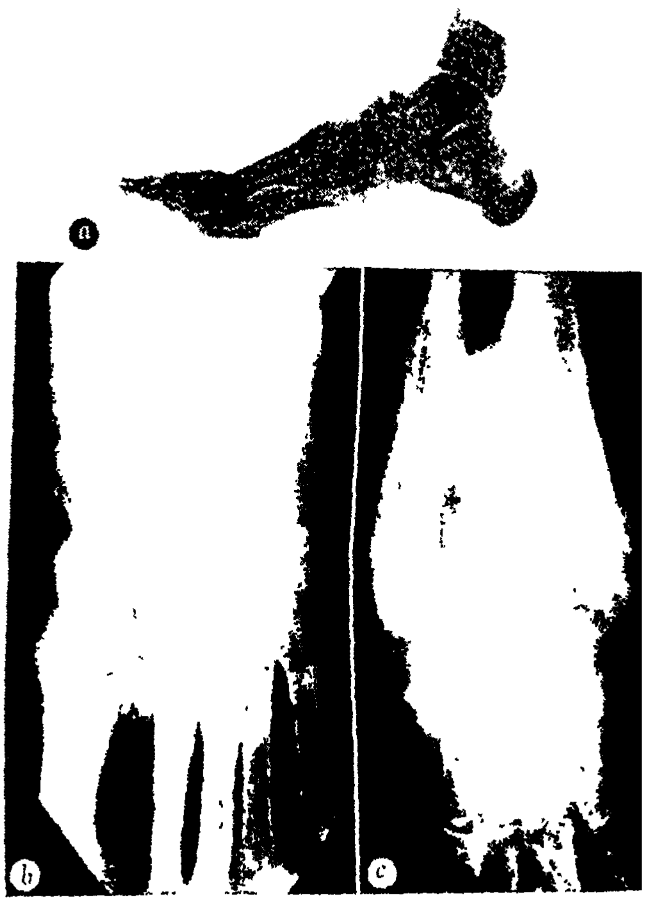

Fig. 3.—Examples of purely neurotrophic changes. *a*, Purely neurotrophic changes at talonavicular joint in 69-year-old diabetic patient. Neurotrophic ulcer of fourth toe, remote from talonavicular joint, had been present only four weeks *b*, Neurotrophic changes at first tarsometatarsal joint with proliferative changes between bases of first and second metatarsals in 62-year-old patient with myelodysplasia. Neurotrophic ulcers were also present at tips of third and fourth toes remote from site of neurotrophic joint changes. *c*, Typical Charcot ankle in 50-year-old patient with syringomyelia Neurotrophic ulcer was over second metatarsal head of opposite foot.

Neurological examination is necessary not only to establish a diagnosis but also to map out zones with sensory changes; information on these zones is helpful to the surgeon if amputation is deemed advisable. Sensory alteration which follows dermatome patterns is found in radicular lesions, myelodysplasia, and old injuries of the cord; this is not true in diabetic neuropathy.

All the available roentgenograms of these patients were reviewed. In cases in which roentgenograms were not available for study, the recorded description and opinion of the roentgenologist were accepted; these roentgenograms were nearly all reported as showing no abnormality. In our opinion, changes of a degenerative character in any foot with proved peripheral sensory impairment are indicative of neurotrophic arthropathy The association of bony proliferation that is meaningless or excessive should further alert the clinician. Periosteal thickening, if affecting a site remote from an ulcer, may be significant. Proliferation and sclerotic changes at the first metatarsophalangeal joint and the midtarsal joints are significant. It is difficult to believe that such changes in the midtarsal or ankle joint could be caused by infection in the fore part of the foot. At the same time "pencilling" of the metatarsals and purely destructive changes in the phalanges and metatarsal heads can be infectious rather than neurotrophic. It would seem logical that these two types of changes could coexist.

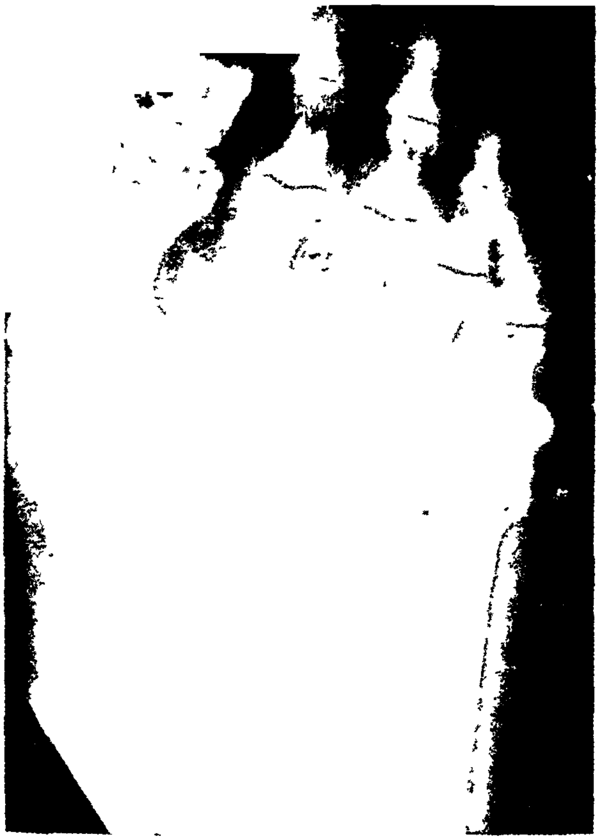
Fig 4—Example of combination of neurotrophic and infectious bony change Proliferative changes are at first metatarsophalangeal joint Change in second and third metatarsophalangeal joints is probably secondary to infection There are changes of neurotrophic nature at first tarsometatarsal joint.

Our criteria for assigning a particular bony change are demonstrated in figures 3, 4, and 5. Figure 3 portrays examples of what we call purely neurotrophic changes. Figure 4 demonstrates what we think is a combination of neurotrophic and infectious changes in the joints; we consider this a mixed roentgenographic finding. What we classify as questionable (fig. 5) are probably infectious changes in the bones or joints. The roentgenographic findings in the 47 patients with neurotrophic ulcers are given in table 1 on the basis of the foregoing criteria.

Treatment

Conservative measures are most important in a proper program of therapy. Control of the metabolic problem in diabetes is paramount. Good footwear, with well-placed pads and bars, is essential. It is important that these measures be continued as adjuvants to any surgical procedure. In this series of cases nearly all of these measures had been tried prior to the patient's arrival at the Mayo Clinic.

The surgical procedures used in these 47 patients are given in table 2 The results of these procedures were evaluated 1 to 10 years later. A follow-up period of less than two years was not considered adequate for determining definitive results. The fact that a multitude of surgical procedures had been done on a small number of patients made evaluation difficult. Hence, we shall present here only the impressions that were gained from the follow-up.

For ulcers under metatarsal heads, removal of the toe and the metatarsal head was often successful. In some cases removal of the metatarsal head alone was of lasting benefit. This was best performed as a two-stage procedure, and in some cases it was better to allow healing by second intention than by secondary closure. Figure 6 demonstrates an ulcer

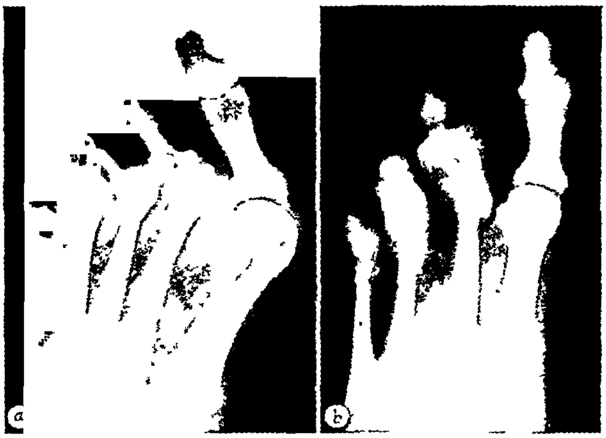

Fig 5—Examples of questionable, though probably infectious, changes in bones and joints *a*, Appearance of foot six years after removal of fifth metatarsal and phalanges of 27-year-old patient with myelodysplasia and five-year history of ulcer over fifth metatarsal head. Third and fourth proximal phalangeal shafts are attenuated. There has been no soft-tissues infection in six-year period since operation. Changes may be secondary to infection or of neurotrophic nature. *b*, Recurrent neurotrophic ulcers in another patient, on plantar surface of fore part of foot for 10 years Changes in fourth and fifth metatarsal shafts appear to be infectious Third metatarsal was amputated elsewhere.

so treated. Diabetic neurotrophic ulcers of relatively short duration (6 to 18 months) were most frequently treated in this way.

Below-knee amputation was at times the only answer to a difficult situation in which recurring ulcers, often multiple, had plagued the patient for years. One Syme amputation was performed successfully in a patient with myelodysplasia. This is significant in that the neurological examination showed that the proposed heel flap had good sensation and points up the value of a neurological investigation. Transmetatarsal amputation was performed only twice, both instances in diabetics, and failed on both occasions. Both of these patients had had recurrent ulcers for 10 years.

TABLE 2.—*Forty-nine Operative Procedures on Forty-seven Patients with Neurotrophic Ulcers*

Operation	Result*	Diabetes	Myelodysplasia	Syringomyelia	Old Cord Injury	Sciatic Nerve Injury	Miscellaneous
Toe amputation	S	7	2	...	...	...	...
	F	2	...	1	...	...	...
	I	1	...	...	...	...	1(undetermined)
Excision of metatarsal head	S	1	...	...	...	..	1(tabes)
Amputation Below knee	S	..	2	1	1	..	...
	I	..	1	...	...	...	...
Syme	S	...	1	...	...	...	...
Transmetatarsal ...	F	2	...	...	...	1	..
Curettage of ulcer	S	1	...	2	2	...	1(herpes)
	F	2	..	1	...	...	...
	I	2	1	1	.	..	...
Excision and skin graft	S	1	1	..	.	.	1(P.N.†)
	F	...	...	..	1	.	...
Excision and pedicle graft	S	...	...	...	.	1	...
	F	1	...	...	1	...	...
	I	...	...	...	...	1	...
Total		23	8	6	5	3	4

* S = successful; F = failed; I = follow up inadequate or less than 2 years.
† Peripheral neuritis in rheumatoid arthritis.

Cross-leg pedicle skin grafts failed in three out of four patients. The fourth patient had an excellent early result one year later; the ulcer in this case was associated with an injury to the sciatic nerve.

Simple débridement of the ulcer was successful in some patients. It would seem to be indicated in elderly diabetics with symptoms of short duration, especially if combined with properly fitted shoes and restriction of activities.

Comment

Neurotrophic ulcers have not received adequate attention in recent medical writings. Any persistent, nonhealing ulcer, particularly when associated with a callus, should alert the clinician to neurotrophism as the cause. In the diabetic patient, particularly the elderly one, more thought should be given to prophylactic measures to protect the region of the metatarsal heads. Perhaps routine roentgenographic examination of the feet of the diabetic patient would be advisable.

Once neurotrophic ulcer is an established fact, a variety of therapeutic measures are available. These include simple curettage, removal of the metatarsal head, toe amputation, and major amputation. The duration of symptoms, the age of the patient, and the underlying cause are factors that must be evaluated. In the elderly diabetic with a neurotrophic ulcer of few months' duration, débridement of the ulcer and trimming of the callus, combined wit restriction of activity and the wearing of adequate ly padded shoes, may be sufficient to heal the ulce and prevent further difficulty.

In patients in the third decade of life with my lodysplasia and prolonged, recurrent neurotroph ulcers a major amputation may be the only tre ment of lasting benefit, but the amputation shou be done at the lowest level possible. The chance involvement of the other foot must be kept in mi

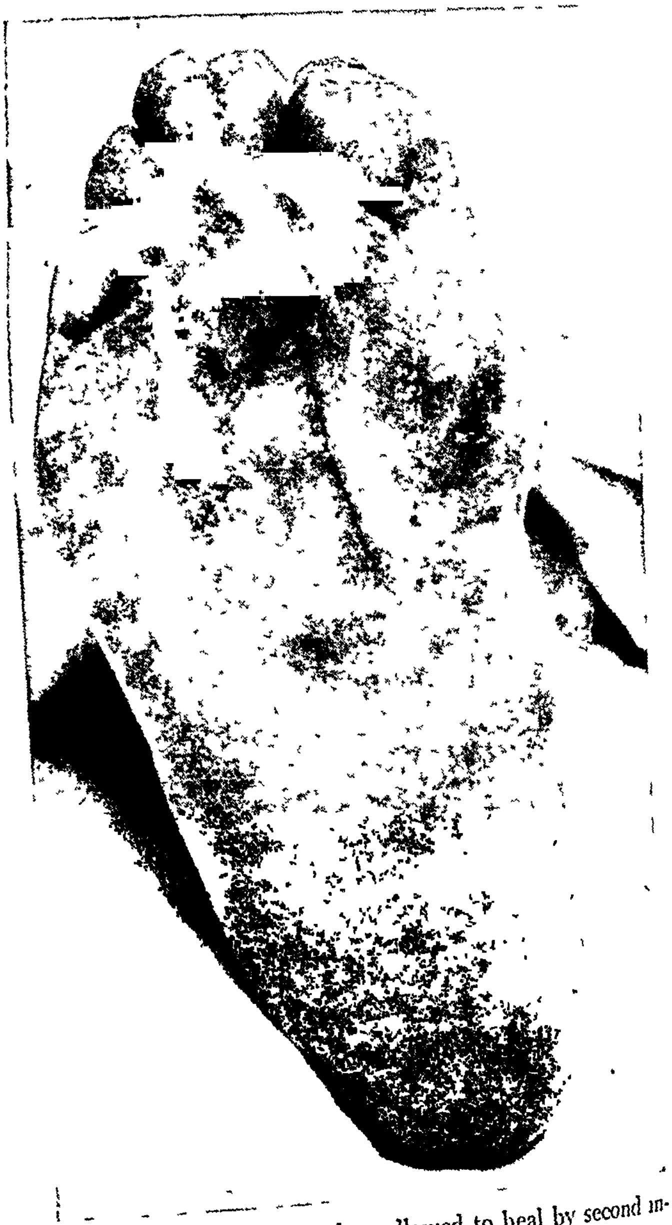

Fig. 6.—Neurotrophic ulcer allowed to heal by second intention after removal of fourth metatarsal head.

Finally, in diabetic patients lesions of the foot due to occlusive vascular disease constitute an entirely different problem and have been discussed by one of us and Janes[13] elsewhere. Infection, neurotrophic factors, and occlusive vascular disease can and usually do, in some degree, coexist in the diabetic patient. When occlusive vascular disease of a moderate to marked degree is present, the foot must be treated primarily for the occlusive vascular disease. Ill-advised minor surgical procedures may hasten the need for a major amputation.

References

1. Jelliffe, S. M.: Report of Two Cases of Perforating Ulcer of Foot with Notes and Bibliography, New York M. J. **60:**458-464 (Oct. 13) 1894.

2. Martin, M. M.: Neuropathic Lesions of Feet in Diabetes Mellitus, Proc. Roy. Soc. Med. **47:**139-140 (Feb.) 1954.

3. Jackson, M. A.: Familial Lumbo-sacral Syringomyelia and Significance of Developmental Errors of Spinal Cord and Column, M. J. Australia **1:**433-438 (April 2) 1949.

4. Van Epps, C., and Kerr, H. D.: Familial Lumbosacral Syringomyelia, Radiology **35:**160-173 (Aug.) 1940.

5. Lessmann, F., and Poth, A.: Röntgenologische Studie als Beitrag. *zu trophischen Knochenveränderungen*, Fortschr. Geb. Röntgenstrahlen **72:**197-201 (Dec.) 1949.

6. Mulvey, B. E., and Riely, L. A.: Familial Syringomyelia and Status Dysraphicus, Ann. Int. Med. **16:**966-994 (May) 1942.

7. Barraquer-Ferré, L., and Barraquer-Bordas, L.: Trophic Disorders of Feet in Acquired Lesions of Cauda Equina, J. Nerv. & Ment. Dis. **116:**902-911 (Dec.) 1952.

8. (*a*) Kulowski, J., and Perlman, R.: Skeletal Changes in Malum Perforans Pedis, Arch. Surg. **32:**1-21 (Jan.) 1936. (*b*) Treves, F.: Treatment of Perforating Ulcer of Foot, Lancet **2:**949-951 (Nov. 29) 1884.

9. Hodgson, J. R.; Pugh, D. G.; and Young, H. H.: Roentgenologic Aspect of Certain Lesions of Bone: Neurotrophic or Infectious? Radiology **50:**65-70 (Jan.) 1948.

10. Ritvo, M.: Bone and Joint X-ray Diagnosis, Philadelphia, Lea & Febiger, 1955.

11. Martin, M. M.: Diabetic Neuropathy: Clinical Study of 150 Cases, Brain **76:**594-624 (Dec.) 1953. Reference 2.

12. Kern, H. M.: Treatment of Perforating Ulcers of Foot Complicated by Diabetes and Peripheral Vascular Disease, South. M. J. **41:**14-21 (Jan.) 1948.

13. Kelly, P. J., and Janes, J. M.: Criteria for Determining Proper Level of Amputation in Occlusive Vascular Disease: Review of 323 Amputations, J. Bone & Joint Surg. **39-A:**883-891 (July) 1957.

RECENT EVALUATION OF THE TREATMENT OF TETANUS

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The plan for managing patients with tetanus has three features: immunization, diagnosis, and sedation. Their effectiveness is shown by experience with 17 patients over a period of 7 years. The mortality was 17%, which is lower than the national average of 40%. As soon as tetanus is suspected, an anesthesiologist is requested to begin sedation by large doses of short-acting barbiturates injected intramuscularly at six-hour intervals. Promethazine hydrochloride is given intramuscularly midway between the barbiturate injections to reduce the anxiety of the patient. A prophylactic tracheotomy is performed under local anesthesia, and a supportive program is then started. The sedation is maintained in order to prevent convulsions with apnea; while it continues, the patient must be turned every two hours to prevent decubitus ulcers and hypostatic pneumonia. After the initial critical period of 7 to 10 days, oral medication generally becomes possible.

Tetanus is an infectious complication of wounds caused by Clostridium tetani and its toxin. It is characterized by local or generalized convulsive spasms of voluntary muscle which may result in periods of respiratory arrest. There is a high mortality—40-50%. Tetanus can occur as a complication of large or small wounds, lacerations, fractures, burns, abrasions, abortions, insect bites, and postnatal separation of the umbilical cord.

The management of tetanus at the Indiana University Medical Center has evolved during the past seven years through treatment of 50 patients, ranging in age from 18 months to 75 years. Management can be accomplished by a coordinated team of anesthesiologist, ear, nose, and throat specialist, internist, and/or pediatrician or by a single physician in a smaller hospital. The success of the treatment depends on early diagnosis. The object is to prevent asphyxia by controlling the muscle spasms and to provide good supportive care.

As soon as tetanus is suspected, an anesthesiologist is requested to begin sedation. Initially, sedation

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is produced by large doses of barbiturates, while a prophylactic tracheotomy is performed with the patient under local anesthesia. A supportive program is then started.

Sedation

Short-acting barbiturates, for example, secobarbital (Seconal) sodium and pentobarbital (Nembutal), are the drugs of choice. Their short action prevents long periods of overdepression while the dosage is being adjusted. The initial dose is 3 to 5 mg. per pound given intramuscularly for children and 100 to 150 mg. given intramuscularly for adults. During the first 24 to 72 hours, this may be given every two, three, or four hours, depending on the judgment of the anesthesiologist as he sees the patient at these intervals. It can be supplemented by the anesthesiologist with intravenously given thiopental (Pentothal) sodium or thiamylal (Surital) sodium if convulsions occur. The intramuscular route is preferred because of the predictable rate of absorption, which is lacking in both the orally and the rectally given medicaments. A continuous intravenous drip is avoided because the patient is more apt to become overdepressed.

The object of the sedation is to prevent convulsions with apnea. The patients will not be flaccid with barbiturates. There will be muscle rigidity and some opisthotonos, but convulsions resulting from external stimuli can be prevented. Some response to stimuli is felt to be beneficial in decreasing the pulmonary complications. As an additional aid in reducing external stimuli and, hence, the total amount of barbiturates given, the patient is placed in a quiet, darkened room, preferably with air conditioning. This is of additional value in maintaining water balance, since the patient with tetanus characteristically has diaphoresis. Some of the usual nursing duties, such as daily baths, must be stopped. However, turning the patient every two hours to help prevent decubitus ulcer and hypostatic pneumonia is essential.

After the initial critical period of 7 to 10 days, it may be necessary to consider oral medication if the patient can swallow adequately. If swallowing is still a problem, then gavage or rectal route is indicated. This is necessitated by the small amount of muscle mass in children compared to the large amount of induration with intramuscularly administered barbiturates.

To meet this problem, promethazine (Phenergan) hydrochloride has been added to the regimen. The adult dose is 25 mg. given intramuscularly every six hours, with the barbiturate given midway between. Four adults have been treated in this manner, and each reported less anxiety about his condition after the promethazine was added. This is important, since the patient with tetanus remains lucid during his periods of wakefulness.

Wound Management

The site of infection, if located, is débrided, and tetanus antitoxin is injected locally. The patient also receives 50,000 to 100,000 units of tetanus antitoxin to neutralize the free toxin. The patient is given a skin test prior to the antitoxin administration, but a routine prophylactic treatment against serum reaction is not done.

Additional care includes hyperventilation by the anesthesiologist and therapy with antibiotics to decrease the incidence of pulmonary complications. Physical therapy is started as soon as possible, usually about two weeks after the patient's admission. This helps to relieve the residual muscle spasm frequently present in the hips, back, and masseter muscles.

Complications

The pulmonary complications have been mentioned. One patient, an 18-month-old boy, required an additional three weeks of hospitalization for skin grafting after a slough from subcutaneous rather than intramuscular injection of barbiturates. As a result of this incident, the nurses record the site of injection so that rotation is assured. Since this procedure was started, one year ago, this complication has not recurred.

Another child developed foot drop from being taped to a sand bag for seven days during intravenous therapy. He subsequently recovered. The veins must be watched carefully for evidence of thrombophlebitis.

A 31-year-old woman died on her second hospital day. She had received psychiatric therapy for an anxiety reaction a few years previously, and her muscle spasm and tight jaw was diagnosed as conversion reaction. Tetanus was not considered until a few hours prior to her death. At this time, the history was obtained of the patient being hit by a piece of brick thrown by a power lawn mower seven days earlier. This case clearly illustrates the need for a high index of suspicion in all cases of muscle spasm and the need for prophylactic immunization of all adults as well as children.

Summary

The management of patients with tetanus at the Indiana University Medical Center has evolved during the past seven years. The curare drugs were used prior to 1955. Since 1955, only the barbiturates and promethazine hydrochloride have been used. There have been 17 patients with tetanus during this time; only three fatalities occurred, and one patient who died had not been seen in the anesthesiology department. This gives a 17% mortality rate, compared to a national average of 40%. All of the patients who died had an incubation period of less than seven days. The three important features of management are immunization, diagnosis, and sedation.

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DIAGNOSIS, TREATMENT, AND POSTOPERATIVE CARE OF BLADDER NECK OBSTRUCTION

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The physician in general practice is important in both the preoperative diagnosis and the postoperative care of the patients with obstruction of the neck of the bladder. The diagnosis is not always easy, for neither the degree of difficulty in urination nor the size of the prostate as judged by rectal examination is a completely reliable criterion for the need of surgery. The author believes therefore that endoscopic examinations should be done oftener than in the past. Experience with 2,160 men who underwent transurethral resection for prostatic hypertrophy during the 12-year period from 1946 to 1957 inclusive showed that the home physician should be prepared for some of the complications that may occur after the patient has left the hospital. These include extravasation of urine, hemorrhage, retention, incontinence, pyuria, stricture of the urethra, and contracture of the vesical neck. Pus, with or without bacteria, usually persists in the urine for several months. The indiscriminate use of antibiotics is to be discouraged. Unless the pyuria is accompanied by other painful or disquieting symptoms, no great effort should be made to eliminate it, since this is impossible until wound healing is complete.

It was suggested that this paper on bladder neck obstruction should be prepared with the interest of the general practitioner in mind and it is our hope that it will be of help to him in attaining a better understanding of the problems of diagnosis, where the diagnosis is obscure, as it not infrequently is, and of the problems connected with the postoperative care of the patient after he has been returned to his home, which often is a considerable distance from the hospital in which his operation was done.

The extent to which the referring or home physician can participate in the postoperative care of these patients depends on his interest, his training, and his equipment. Not every family physician has the equipment in his office for catheterization, bladder lavage, and the passage of sounds, nor does everyone care to take the time necessary for that phase of treatment. Nevertheless, a thorough understanding of the problems that may arise during the postoperative period will help the family physician to contribute greatly to the recovery of the patient.

Diagnosis

Bladder neck obstruction in men is usually due to an enlargement of the prostate or to contracture of the margin of the vesical outlet, and the diagnosis is suggested by the patient's story of having difficulty in passing urine. This difficulty may vary from nothing more than a slight reduction in the size and force of the stream, with a tendency of the stream to be interrupted, to a complete retention of urine requiring immediate catheterization.

The degree of difficulty experienced by the patient cannot be depended on as a criterion of his need for surgical treatment, since occasionally large amounts of residual urine and even renal damage from back pressure will be found in men who have been having only the slightest amount of subjective difficulty. Nor can the size of the prostate as determined by rectal palpation be depended on as a measure of the degree of bladder neck obstruction present, since in many instances the obstruction will be due to an intravesical enlargement of the prostate, not palpable through the rectum, or to a collar of tissue at the vesical outlet.

Because of these and other considerations, we make endoscopic examinations promptly on men whose symptoms even slightly suggest obstruction, if other findings have not enabled us to evaluate the situation satisfactorily. A 16 F. or an 18 F. panendoscope is used and the examination can be made in the office in 5 to 10 minutes without anesthesia and usually with very little pain or reaction. The information obtained by this procedure permits an evaluation of the degree of obstruction and of any need for surgical intervention.

Treatment

There are several operations for the relief of bladder neck obstruction and, with drugs to control urinary sepsis, better anesthesia, and a better understanding of physiology, each operation is relatively

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safe when compared with the experiences of 20 years ago. Some urologists prefer one method and some prefer another but the majority recognize that the transurethral resection is best suited in those cases in which the amount of tissue to be resected is small, and perhaps a majority will, when possible, prefer to use the transurethral method in operating on their extremely aged and especially poor risk patients.

Certain advantages are claimed for each procedure but the principal advantage claimed for the open enucleation operations, such as the retropubic, the suprapubic, and the perineal prostatectomies is that there is less postoperative morbidity from persisting urinary infection because of the more complete removal of the prostate than is sometimes accomplished by the transurethral method. Of course, this depends entirely on how thoroughly the prostate is resected transurethrally, for if it is adequately resected the patient is no more likely to have prolonged difficulty than if one of the other methods had been used. Neither is it to be understood that any of the enucleation operations, done by open operation, will prevent the recurrence of obstruction at a later date, although there is a slightly higher incidence of recurrence of obstruction after transurethral resection.

Occasionally some patient will report that he has been advised to have his prostate removed by open surgical enucleation instead of by transurethral resection so that he would not develop cancer of the prostate later on. This argument is, of course, entirely specious. No matter what method is used any patient may subsequently develop carcinoma of the prostate, since it usually develops in the posterior lobe which is not removed by anything less than a radical prostatectomy.

On the other hand, the transurethral operation is less likely to result in a stormy postoperative course and carries with it a lower operative mortality than do the other methods. This in spite of the fact that it carries an added burden imposed by its use in the extremely aged and poor risk patients. Also it is less likely to be followed by incontinence of urine and is less likely to produce sexual impotence, which is important to some.

As to the restriction of the transurethral resection to the smaller prostates, that, of course, is a matter that has to be decided by each individual surgeon. As the physician's experience in doing transurethral prostatectomies increases, he will be inclined to apply it to larger prostates. Certainly the operation can be long and tedious and requires painstaking care.

Some urologists take the position that a prostate should not be resected transurethrally if it is anticipated that the procedure will require more than an hour, but we cannot agree with the validity of this conclusion. With satisfactory low spinal anesthesia under the supervision of a competent anesthesiologist and with careful attention to hemostasis throughout the operation, it has been our experience that one hour or three hours makes little difference except in the weariness of the operator.

This discussion is based on an experience with 2,529 transurethral prostatectomies done on 2,160 men during the 12 years prior to 1958. All of these were private patients and all were operated on by one of us (E. H. R.), who personally provided most of such postoperative care and treatment as was required.

The patients' ages ranged from under 50 years to 97 years, with 16 being above 90 years of age. Most were in good physical condition generally, but many were severely debilitated from degenerative diseases, having developed urinary retention in conjunction with such things as cerebral vascular accidents and coronary thrombosis. Having been admitted for one condition, they could not be rehabilitated until after being relieved of the associated obstruction and, although constituting an advanced risk group, they had to be operated on in spite of the realization that the hazards of surgery were exceedingly great. If concern for our statistical record had been allowed to be of influence, suprapubic cystostomy instead of transurethral resection might have been used in many of these poor risk patients. It seemed, however, that transurethral resection did not carry much, if any, greater risk than suprapubic cystostomy, so transurethral resection was undertaken.

In this series there were 25 deaths for a percentage of 1.04, and in arriving at this figure multiple resections during the same hospital admission have been counted as one. Six deaths which were counted as operative deaths occurred 26, 35, 38, 42, 60, and 67 days after operation and were included because for one reason or another the patient remained in the hospital far beyond the time he might have been expected to do so. Most of these six were nursing problems when admitted to the hospital and were allowed to remain in the hospita after operation for lack of facilities at home. If less rigid statistical standard had allowed the elimination of these six cases as operative fatalities, th percentage would have been reduced to slightl less than 0.8%.

Complications and Postoperative Care

A statistical review of this entire group of patients has not been completed, but such a review of a number of consecutive cases is perhaps sufficient to establish a reliable trend.

Urinary Extravasation.—Four patients out of a group of 888, or 0.045%, had perforation of the capsule at the time of operation, with extravasation of the irrigating fluid. All occurred as the resections were being completed and were characterized by lower abdominal pain and rigidity of the abdominal wall. All were recognized promptly and relieved by suprapubic drainage of the prevesical and lateral vesical spaces. All four patients recovered without further incident.

Postoperative Bleeding.—Bleeding may be slight to severe and may occur anytime from immediately after the operation until the time of complete wound healing, with the tendency to bleed being gradually reduced as wound healing takes place. In our experience troublesome bleeding rarely occurs after three weeks but has occurred six weeks after operation.

Most of the time the bleeding will be controlled by the use of an indwelling catheter with irrigations through a semiclosed apparatus making use of a gradual decompression feature. We use a 22 F. self-retaining catheter with 10-cc. balloon and do not pull it down. Neither do we waste much time trying to control severe bleeding with irrigations but prefer to return the patient to the operating room before there has been much loss of blood. Of 888, 15 (1.6%) had to be returned to the operating room for control of postoperative bleeding.

After returning home, many patients will experience the passage of small amounts of blood at the beginning or at the ending of urination. This need cause no concern, but if it is found that clots are being formed and that the patient is having some difficulty in expelling them, prompt intervention is indicated and the patient should be returned to the care of the urologist as quickly as possible. If complete retention has already occurred, catheterization by the home physician may remove enough of the contents of the bladder to make the trip back to the hospital less of an ordeal than it would otherwise be.

Postoperative Retention of Urine.—A number of these patients will be unable to urinate adequately after the catheter has been removed and may continue to have moderate to large amounts of residual urine for days and even weeks after the operation. This is not necessarily due to any inadequacy of the resection, although that possibility should be thought of first and either ruled out or discovered by endoscopic examination before too much time has been wasted. Many times the persisting retention will be due entirely to an atonicity of the bladder, perhaps the result of arteriosclerotic changes in the cord or to long-standing overdistention of the bladder prior to surgery. Most of these patients will gradually improve to the point of complete or almost complete emptying of the bladder, although the weeks required for this to be achieved are among the most discouraging for the urologist as well as for the patient.

The presence of a large diverticulum of the bladder may at times be the only reason why some patient fails to empty his bladder satisfactorily after operation, for even in the presence of a competent detrusor the inelastic walls of the diverticulum will allow large amounts of urine to be retained there. Only surgical removal of the diverticulum will correct this situation.

Incontinence of Urine.—In this group of 888 patients, 3 (0.033%) had incontinence of urine which persisted after wound healing had occurred and inflammation had cleared. Many experienced a transitory small degree of incontinence after the operation, consisting of nothing more than the loss of small amounts of urine on coughing, sneezing, or on suddenly getting up out of bed or out of a chair. Sometimes this loss is the result of the urgent desire to urinate which results when an amount of urine accumulates in the as yet unhealed bladder. When such incontinence is only slight in degree and not the result of persisting inflammation, a routine of exercise for the strengthening of the muscles of the perineum in which the patient is instructed to practice starting and stopping the urinary stream repeatedly will often help to overcome the tendency to leak.

Persisting Infection.—All patients whose prostates have been operated on, no matter what the method, may be expected to have infected urine for a long time. In the majority, if the obstruction has been completely relieved, the infection will gradually clear up, requiring little or no help from the physician. Unless accompanied by symptoms, the mere presence of pus in the urine during this period should cause no concern.

If the patient, however, during the early weeks or months after the operation is found to be having much frequency of urination, with discomfort, marked infection of the urine, and perhaps not an entirely satisfactory stream although he may be emptying his bladder completely as determined by catheterization, the presence of remaining obstructing tissue has to be suspected and the sooner it is discovered the better it will be for all concerned. The passage of a 14 F. rubber catheter coudé should enable one to discover any stricture of the anterior urethra as well as the presence of any residual urine. The absence of residual urine, however, does not give assurance that there is no impediment to the passage of urine and much can be learned by watching the patient urinate. A large, robust stream starting promptly and continuing without interruption to conclusion is very good evidence of a satisfactory function. If the stream is slow to start, however, is something less than forceful, and tends to be interrupted, it is to be suspected that an obstruction at the neck of the bladder does exist and endoscopy will probably reveal the presence of intraurethral intrusions from the lateral lobes of the prostate, usually at the apex, which will have to be resected before the patient can obtain a satisfactory result.

It is very difficult to have to tell such a patient that he needs further surgery, yet it is better to be in a position to tell him yourself than to have him learn the dismal fact from another urologist.

On the other hand, the patient's difficulties may not be the result of inadequate surgery at all, but may be due to the fact that he has a severe infection by one of the more virulent bacteria and until effective medication is used it may be impossible to give him relief. The difficulty of eliminating such infections is often made more difficult by the presence of severe trabeculation with cellules and small diverticula in the walls of the bladder that tend to retain infected urine.

Since all of these patients should be expected to have pus in the urine, with or without bacteria, for an average of several months, it is not necessary to be concerned about its presence during this period unless accompanied by painful and unduly frequent micturition. Unless such symptoms are present, no great effort should be made to eliminate the pus from the urine, since this cannot be accomplished until after wound healing has been completed.

It has been our practice in the average case, having used chloramphenicol (Chloromycetin) preoperatively and for several days after operation, to keep the patient on therapy with methenamine mandelate (Mandelamine), 0.5 Gm., four times a day for three to four weeks longer and to make use of other drugs only as indicated. The indiscriminate use of antibiotics is to be discouraged and they should be withheld until a definite need is established.

Stricture.—Stricture of the anterior urethra occurred in 9% of 474 of these patients, and most strictures occurred at or just proximal to the external urethral meatus and in spite of the fact that meatotomy was done before introducing the resectoscope when the meatus was at all tight. These strictures usually manifest themselves early in the postoperative period within a matter of three or four weeks and respond to treatment by frequent dilatations with relatively small caliber sounds up to size 18, 20, or 22 F. After a relatively short time, perhaps a month or two, the tendency toward further contraction disappears entirely. After these so-called premeatal strictures have been discovered and dilated, it is important that the dilatation be maintained by the frequent passage of a sound or sounds, preferably every day for a few days, and then after intervals of two or three days to a week, depending on how readily the stricture yields to treatment. The physician at home can be of great help in dealing with this complication, or the patient himself may be able to maintain the dilation with an instrument lent to him for that purpose.

Contracture of the Vesical Neck.—Contracture of the vesical neck occurred in 1.4% of 474 cases. This is an exasperating postoperative complication which occurs much less frequently than does stricture of the anterior urethra, and occurs much later, often not manifesting itself until long after complete recovery from the operation has taken place. It is most likely to occur in those patients who originally had small prostates in association with a considerable degree of fibrosis at the bladder neck. At times the contracture is so severe that on endoscopy it will have the appearance of a diaphragm with a filiform opening in the center. Some contractures are easily dilatable with sounds but usually require frequent dilatations at varying intervals for an indefinite length of time in order to maintain an adequate passage. Further resection is usually followed by further contraction, and in most cases the use of sounds is preferable and will be effective. In an occasional case a Y-V plasty anteriorly at the bladder neck and the removal of a wedge of tissue posteriorly may be required.

Summary

The diagnosis of bladder neck obstruction may be obscure, therefore endoscopic examination should be used more frequently for evaluation of the bladder neck situation. Transurethral resection was performed 2,529 times on 2,160 men during a 12-year period, with an operative mortality of 1.04%. With the elimination of six questionable cases, the operative mortality would have been 0.8%. The care of these patients during the postoperative period places emphasis on the complications that may occur after they have been dismissed to their homes and to the care of their home physicians.

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STUDIES ON THE IN VIVO SURVIVAL OF GLYCEROLIZED AND FROZEN HUMAN RED BLOOD CELLS

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Ninety-four units of blood have been collected, glycerolized, stored in the frozen state at either –80 C or –120 C, deglycerolized, stored at 4 C, and then used clinically. A technique has been developed for maintaining sterility at every step. Even after storage at very low temperatures for periods up to 19 months, the red blood cells appeared therapeutically comparable to cells stored at 4 C up to 21 days in a standard A.C.D. (anticoagulant acid citrate dextrose) solution. The longevity of red blood cells in the circulatory system of the recipient was studied by using chromium 51 for labeling and was found to be independent of the duration of storage. The loss of red blood cells by lysis during the process as a whole seemed to be due entirely to irreversible random damage during collection and handling rather than to storage at low temperature. The sterility of the system made possible an additional post-thawing storage of the red blood cells for up to 11 days at 4 C before use in transfusions. No transfusion reactions of any kind were noted.

In 1949, Polge and co-workers[1] made the chance observation that animal and fowl spermatozoa could withstand freezing at –79 C if previously exposed to a 20% glycerol solution. In connection with this work, Smith noted that erythrocytes which contaminated the needle biopsy specimens were not lysed by the glycerol freezing method. Although Luyet[2] previously had demonstrated the freezing of thin films of blood, this had proved to be mainly of academic interest. The observation of Smith opened a possible practical method for the long-term preservation of erythrocytes. An immediate program of study was stimulated in both England and the United States in an effort to define the conditions for glycerol freezing. Subsequent reports by Sloviter,[3] Brown and Hardin,[4] Mollison and associates,[5] and Lovelock[6] have defined the range of protection by glycerol and elucidated some of the mechanisms wherein this substance and other polyhydric alcohols protect cells against lysis during freezing. The general biological effects of freezing have been reported in detail by Meryman.[7] At least three effects of glycerol appear to play a role: 1. The type of ice crystal which forms in its presence is small, uniform in size, and less disruptive on thawing than the large, irregularly spaced crystals which occur when ordinary crystalloid solutions are frozen. 2. The liquid glycerol phase prevents the high salt concentration which otherwise occurs when water changes its physical state to pure ice. 3. The glycerol becomes so viscid at storage temperature around –80 C that it imposes a mechanical barrier to the slow diffusion of cell substances in the liquid phase. The fact that a diffusion of surface membrane does occur has been advanced by Lovelock as an explanation for the gradual loss of viability which occurs even at the coldest storage temperatures. Essentially no metabolic activity takes place at –80 C. Theoretically, one would expect to achieve permanent preservation at this temperature. Such does not take place, however, and the simple loss of cellular substance may explain this paradox.

The prolonged extension of red blood cell viability by low-temperature techniques could prove revolutionary to standard blood-banking methods. Unfortunately, however, it is necessary to remove or greatly to reduce the intracellular glycerol concentration before the thawed cells can be used. Practical methods for the dialysis of glycerol out of the red blood cell proved cumbersome and have delayed the translation of this important fundamental discovery into a practical means of handling blood. In 1951, Cohn and associates foresaw the need for a "closed-system" technique for glycerol exchange and modified a bowl of the Cohn ADL centrifuge then under development in such a manner as to permit this type of dialysis.[8] The details of this fractionation system are outlined elsewhere.[9]

It is the purpose of the present communication to report survival studies on human red blood cells processed in the Cohn ADL fractionator and stored for variable times in the frozen state after equilibration with glycerol.

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Methods and Materials

All studies were carried out with blood which was processed in a Cohn ADL centrifuge, with use of a bacteria-free system throughout the entire period from initial blood collection to final glycerolization after storage. This method offers the distinct advantages of semiautomation with conservation of technician time, maintenance of low blood temperatures without exposure of personnel to the cold, and closed-system sterility which makes possible the use of standard refrigerator storage and blood bank methods after removal from the frozen state.

Blood Collection, Plasma, and Addition of Glycerol.—Blood was collected from healthy human donors by gravity flow into plastic bags (or bottles) containing A. C. D. solution (National Institutes of Health formula A). Selection of A. C. D. solution as an anticoagulant did not reflect any special property of this solution. Rather, its use was based on the desirability of comparing final survival data with published studies [10] on red blood cell survival with use of original collection into A. C. D. solution and standard 21-day storage at temperatures above freezing. Recent studies [11] have indicated that an isotonic citrate-phosphate-dextrose solution minimizes initial damage during collection of blood which might diminish the loss of red blood cells during processing. The blood was next connected to the red blood cell plasma separation bowl of a Cohn centrifuge.

After separation of the plasma, a series of solutions was introduced which effected a gradual introduction of glycerol solution into the red blood cell concentrate in a gradient from zero to 50% glycerol (w/v) over a 45-minute period of time at 17 C. (Solution 1 contained 20% glycerol [w/v] and solution 2, 50% glycerol [w/v], with sodium lactate, 0.156 M, potassium chloride, 0.004 M, and a sufficient amount of distilled water.) A counterflow method of introducing glycerol inside the revolving bowl made possible the maximum intracellular glycerol concentration, in the minimum period of time, with the least cellular damage from osmotic imbalance. Details of the centrifuge speed, temperature, solutions, and equipment are outlined in a separate communication (see page 404). The only variation in technique in the present report was a change in introduction of glycerol to a two-stage method with a gradient from 20 to 50%. This has the dual advantage of increasing the speed of glycerol equilibration and decreasing the osmotic shock to the cells.

At the end of the glycerolizing period, the cells were poured out into an attached bag which was dielectrically sealed and severed from the centrifuge. A sample was removed for bacterial culture, and the bag was placed in a simple cardboard box to protect the plastic, which becomes brittle at the low temperatures of storage. It is then transferred to the −80 C or −120 C locker. The temperature within the bag fell to −45 C within the first two hours but did not reach the final temperature of −80 C for about seven hours. A report by Polge and Lovelock [12] indicates that the rate of freezing and thawing should be slow between 0 and −40 C but is less critical between −45 and −120 C in the presence of glycerol. No attempt was made in the present study to investigate the parameters of optimal glycerol concentration versus time of storage or survival. Original pilot experiments indicated that some temperature below −45 C and some glycerol concentration in excess of 20% was necessary in order to obtain practical yields of cells possessing greater than 70% survival after processing alone. A glycerol concentration of 50% was found satisfactory and was therefore used throughout the study. Later investigation of concentrations between 20 and 50% may reveal equally beneficial effect of lesser amounts of glycerol, but the primary purpose of this study was the adaptation of the closed-system Cohn centrifuge so as to make available large enough amounts of frozen blood to study adequately the survival characteristics. The only variable introduced into the present experiments was the use of two storage temperatures, −80 and −120 C.

Storage of Cells.—Maintenance of steady temperature was striven for throughout storage. Constant recording devices indicated that no major rise in temperature has occurred during the two years the equipment has been in operation. One locker containing 85 units of blood (maximum capacity, 144 units) was stored at −80 C with no significant mechanical troubles and a maximal range of temperatures between −80 and −84 C.

Another locker containing 100 units, maintained at −120 C, gave mechanical trouble on four occasions after it was first installed. During one such period, when it was partially filled, the internal temperature rose to −60 C over a three-day period before the stored cells were transferred to a separate −80 C box. Some of these units subsequently have shown lower yields of cells and higher concentrations of hemoglobin in the supernatant solution but no major difference in survival after transfusion. A full study of the effect of fluctuations in temperature during storage will be the subject of a separate report. Insertion of thermocouples inside bags of blood placed at three depth levels within the lockers showed that the bottom two-thirds of the locker does not have any temperature variation during ordinary operational opening and closing for removal of stored blood. The top one-third of the box is approximately 20% warmer and fluctuates widely over a 30-degree range; it is not recommended for storage unless provision is made for internal circulation of the air.

Removal of Glycerol.—After storage, individual units of blood were removed at stated time intervals, thawed by immersion in a 37 C to 40 C water bath (average elapsed time, 12 minutes), and deglycerolized in the Cohn fractionator. The technique for removal of glycerol is essentially the reverse of the initial processing. A bag of thawed cells was attached to a sterile cartridge of the machine and forced under normal pressure into the revolving bowl. A series of attached solutions was then fed through the revolving cell suspension, providing for a stepwise decrease in glycerol concentration from 50% to less than 1% (range, 0.32 to 0.9%, corrected for glucose). This was achieved by maintenance of an osmotic gradient of lactate ions outside the cells long enough to permit the glycerol slowly to diffuse out before water can shift intracellularly and cause rupture. The rate of water endosmosis was roughly four times as great as that of glycerol exosmosis. It is for this reason, rather than that of possible glycerol toxicity, that nearly complete glycerol removal is desired. Direct transfusion of thawed glycerolized cells would result in prompt lysis when the erythrocytes were exposed to the 0.15 M ionic strength of blood. Lovelock,[13] Sloviter,[14] and others have suggested the use of concentrated glucose solutions to remove most of the glycerol from the cells and to provide for dilution of the remainder. Such methods possess the side-effects of prohibitive volumes of final administration solution and the need for immediate transfusion after processing due to cellular fragility. Moreover, cells processed by these methods showed a short survival time and high rate of in vivo lysis when studied in this laboratory.

The three wash solutions used for deglycerolization are as follows: (1) sodium lactate, 0.496 M, glycerol, 10% (w/v), potassium chloride, 0.004 M, and a sufficient amount of distilled water; (2) sodium lactate, 0.156 M, potassium chloride, 0.004 M, and a sufficient amount of distilled water; and (3) sodium chloride, 0.15 M. The time required for removal of the glycerol varied between 80 and 120 minutes. The cells were then allowed to flow from the centrifuge bowl into a bag containing 60 cc. of the following resuspension mediums: 400 mg.% of dextrose, 20 mEq. per liter of potassium, and sufficient albumin to give a final concentration of 2 Gm.% after dilution by the red blood cell mass. The pH of the final suspenion was 7.1. The bag of resuspended cells was then sealed, severed from the cartridge, and transferred to a standard 4 C refrigerator for storage until use. Simultaneously, a diverticulum of the bag was removed and cultured at three temperature ranges (4 C, room temperature, and 37 C) in thioglycolate broth and Saboraud's medium. Of 419 cultures done in connection with the present experiments, 416 were negative for bacteria or fungi; in the case of the three positive cultures, known breaks in technique occurred at the time of the original stylet connection between the donor's blood and the machine in two instances, and one bag ruptured during thawing.

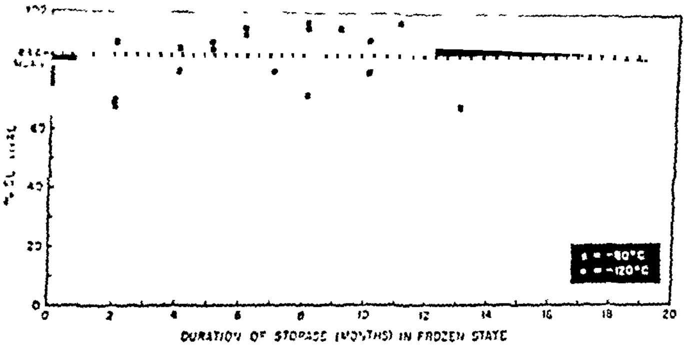
The estimated loss of cells during processing was as follows: loss and hemolysis from collection, glycerolization, freezing, and deglycerolization, 10%; intact cells left on walls of containers and plastic bags and tubes, 5%; intact cells sacrificed for bacterial cultures and glycerol assays, 3%; intact cells sacrificed for typing, cross-matching, and serology, 1%; and hemolysis from storage in the frozen state, 0.5%. The technique of the study prohibited quantitative study of the total cell mass at each step of each experiment. However, certain general features were consistently noted: 1. The average decrease of 10% of cells from collection, glycerolization, and freezing represents a relatively fixed loss which is part of the processing itself. In occasional experiments this loss was as little as 2%, but a higher figure generally was noted. 2. The 3% loss through bacteriological sampling and glycerol assay can be eliminated almost completely if one wishes to use this type of processing on a routine, blood-bank basis. 3. The 5% loss on the walls of containers, plastic bags, and tubes also can be reduced if one wishes to take greater time to allow complete drainage after transfer from one bag to another.

Storage at 4 C.—All cells used in this study were stored at least three days in a standard refrigerator after removal from the frozen state and deglycerolization. The longest postprocessing storage of a blood subsequently used for transfusion was 11 days. This unique advantage of the Cohn closed-system centrifuge processing permits standard shipment to a hospital or medical center where the reconstituted red blood cells are to be used. It also permits an unhurried selection of recipients with proper blood type and cross-matching compatibility. In the present study, no plasma or serum was saved from the original blood donor. Recipient compatibility was therefore based on (1) similar blood group between donor and recipient, (2) compatible "major" cross-match (donor cells and recipient serum), (3) Coomb's cross-match, and (4) resuspension in saline solution and observation for absence of autoagglutination.

An attempt was made to utilize the processed cells within one week after removal from the frozen state. This was because of the gradual accumulation of free hemoglobin in the supernate of the resuspended cells stored at 4 C. The factors responsible for such cell lysis are not understood, but, on the basis of current work, they are believed, in part, to represent inadequate support of the metabolic needs of the cells at refrigerator temperature. Recently, the resuspension medium used for all of the studies reported herein was abandoned in favor of a simple solution consisting of 30 ml. of the original donor's plasma with A. C. D. solution added plus sufficient glucose to raise the final concentration to 100 mg.%. This has markedly decreased the accumulation of hemoglobin during storage at 4 C. The good survival data obtained on the cells that were still intact at the time of any given transfusion also suggest that the hemolysis at 4 C is not a continuation of damage initiated at the time of processing but that it is a property of the postprocessing storage conditions.

Results

Ninety-four units of blood were collected, glycerolized, stored in the frozen state, deglycerolized, stored at 4 C, and then administered to selected recipients by the methods outlined above. Thirty-three of the units were labeled with chromium 51 prior to final transfusion and studied for subsequent survival in the recipient. All tagging and counting was carried out in the laboratory of one of us (J. G. G.). The untagged units were used directly at the New England Deaconess Hospital as packed red blood cells and were administered for therapeutic use and for observation of recipient effects.



Survival of chromium 51–tagged preserved red blood cells.

Untagged Blood.—No unfavorable reactions of any kind were observed after use of untagged units. This, in itself, seemed surprising, as the original recipients were selected from a hospital population consisting chiefly of patients with fatal blood disorders and far-advanced malignant states wherein pyrogenic blood reactions are anticipated in a significant percentage of cases. Some of the recipients d well-documented febrile responses to ordinary nked blood both prior to and subsequent to the ansfusion of frozen cells, without showing pyrogenic reaction to the latter. It is suggested that the absence of fever after transfusion of frozen blood may represent the removal of all plasma components, leukocytes, and platelets, which is an incidental side-effect of the glycerolization process inside the Cohn fractionator.

Recipient red blood cell counts, hematocrit values, and hemoglobin levels, when measured, showed the post-transfusion rise which would be anticipated from comparable amounts of standard banked blood. The maximum number of frozen blood transfusions given to one individual was five. The average volume of the resuspended, packed red blood cells was 350 ml. The administration and therapeutic effectiveness of the frozen blood was in all ways comparable to ordinary banked blood, and no difference in effectiveness was noted between the minimal and maximal storage periods of zero time and 19 months.

Tagged Blood.—All in vivo survival studies utilized chromium 51–labeled red blood cells. Twenty-one units were studied by this method after storage at −80 C for periods between three days and 19 months; seven units were studied after storage at −120 C for periods between five days and 10 months. Studies were also done on an additional five units stored at −20 C prior to availability of the lower-temperature boxes. The techniques for labeling, addition of ascorbate, and counting of samples are reported elsewhere.[15] The volume of labeled cells administered to the recipient was 50, 100, or 350 ml., depending on the specific activity of the radioactive chromium used for tagging and the presence or absence of a therapeutic need for the cells. Samples were removed from a different vein of the recipient 5, 10, and 15 minutes after transfusion, then one and three days after, and then three times per week as long as the patient was available for study. The longest such span was 33 days. Recipient blood volume was estimated on the basis of the first three counts immediately after transfusion. The data for 24 units of blood stored at −80 and −120 C showed a range of immediate survival between 64 and 98%, with a mean of 84.6% (see figure). Two findings are worthy of comment. First, there was no apparent effect from storage time per se. That is, within the period covered by this study, cell survival seemed to be independent of time and reflected merely the effects of processing alone. Red blood cells currently in storage will be studied at future time increments to determine the interval at which loss of cells from storage will exceed the background loss from the methods of processing. Second, the unexpectedly good immediate survival after transfusion may reflect a selective population of cells. It is suggested that the loss of cells by lysis during processing may represent removal of red blood cells undergoing irreversible random damage during collection and processing.

Only 7 of the 100 units of blood stored at −120 C have been studied so far. These are insufficient data for comparison of optimal storage temperature. Due to the unanticipated high rate of survival of cells at −80 C, it may be a considerable period of time before any difference between the two storage temperatures will emerge.

In addition to the immediate post-transfusion survival, the subsequent rate of in vivo decay was followed in four cases where the patients remained in the hospital long enough to permit long-term follow-up study. These data (table 1) show that in two patients the disappearance of labeled cells occurred at a normal rate of 50% in 30 days. In the other two patients, the rate was accelerated to 1.4 and 2.0 times normal. Each of the latter patients was a sick recipient. One received x-ray radiation to a total dose of 1,892 r during the one-month period his cell survival was being followed. The other was in a terminal phase of carcinoma of the intestine and blood loss into the gastrointestinal tract could not be excluded.

In vitro studies have shown oxygen-carrying capacity of the previously frozen erythrocytes to be entirely normal.

Supernatant Hemoglobin.—As noted earlier, post-processing storage of cells at ordinary refrigerator temperature is accompanied by a rising concentration of free hemoglobin in the supernatant solution surrounding the cells. Immediately after deglycerolization and resuspension of the cells, free hemoglobin is present in amounts totalling 150 mg.% (table 2). With storage, this level rises to an average of 240 mg.% at one week and 300 mg.% at two weeks. The amount of free hemoglobin which would be given in any single transfusion would be no greater than 10% more than these figures, as the supernatant phase of the concentrated red blood cells averages about 110 ml. As noted earlier, a recent change in experimental technique resulted in a marked reduction in the above figures for accumulation of free hemoglobin during storage at 4 C in the few instances when it was used. An aliquot of 30 ml. of autologous plasma with A. C. D. solution is saved during storage. Substitution of this for the standard resuspension medium has decreased hemoglobin liberation from twofold to fivefold. This relatively insignificant amount of hemoglobin can be reduced further, if desired, by the simple mechanical removal of the supernatant phase at the time of administration.

Plasma hemoglobin concentrations were studied at five minutes and 24 hours in 33 recipients of frozen blood. The average rise was 30 mg.% immediately after transfusion. In all cases this returned to pretransfusion levels in 24 hours. It is important to select an accurate and sensitive method for determination of plasma hemoglobin level for proper evaluation of studies of this type. The benzidine technique of Crosby and Furth[16] was used throughout this study except for the occasional instance where the amount of hemoglobin was high. In this case the technique of cyanomethemoglobin of Crosby and co-workers[17] was used. Resting pretransfusion recipient plasma hemoglobin levels averaged 20 mg.%, with one isolated reading as high as 60 mg.%. This is above the anticipated range for "normals" but probably was due to the various illnesses present in most of the recipients. *Plasma bilirubin levels were occasionally tested* three hours after transfusion and showed no rise secondary to the administered blood. Hemoglobinuria did not occur in any of the cases.

TABLE 1.—*Rate of in Vivo Decay of Red Blood Cells in Four Patients*

Case No.	Days Sampled, No.	Survival, %	T-½, Days	Rate of Disappearance
15	24	84	28	Normal
18	33	90	16	2 times normal
31	19	90	30	Normal
32	15	86	21	1.4 times normal

* T-½ value is expressed in days, being the day at which the unit activity (Cr^{51}) of red blood cells has fallen to 50% of the immediate survival value, as obtained by extrapolation.

TABLE 2.—*Supernatant Hemoglobin Levels, in Milligrams per 100 Cc., in Stored Resuspended Red Blood Cells*

	Experiment No.		
Storage at 4 C, Days	M604 Resuspension Medium	M628 Resuspension Medium	M561 (10% plasma)
1	150	176	38
3	215	270	50
7	290	310	96
14	380	500	150
21	300	320	210

Experimental injection into rabbits of hemoglobin, washed stroma, and hemoglobin-stroma mixtures, in concentrations ranging up to 100 times the maximum amount of hemoglobin which would be administered in the form of frozen red blood cells, have failed to disclose any deleterious effect or iron accumulation in analyzed organs. These data are the subject of a separate report.[18]

Summary

Human red blood cells processed in a closed-system Cohn centrifuge and stored in glycerol solution at −80 and −120 C have been transfused into recipients after preservation up to 19 months. The sterility of the system made possible an additional post-thawing storage of the cells up to 11 days at 4 C for distribution to the hospital in which the transfusions were administered. No transfusion reactions of any kind were noted. The cells appeared therapeutically comparable to cells in standard A. C. D. solution stored up to 21 days at 4 C.

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The storage cabinets used in this study were designed, constructed, and maintained by the Harris Refrigeration Company, Cambridge, Mass.

References

1. Polge, C.; Smith, A. U.; and Parkes, A. S.: Revival of Spermatozoa After Vitrification and Dehydration at Low Temperatures, Nature **164:**666 (Oct. 15) 1949.
2. Luyet, B. J.: Ultra-Rapid Freezing as Possible Method of Blood Preservation, in Minutes of Conference on the Preservation of the Formed Elements and of the Proteins of the Blood, Boston, Jan. 6-8, 1949, Washington, D. C., American National Red Cross, 1949, p. 141.
3. Sloviter, H. A.: In-Vivo Survival of Rabbit's Red Cells Recovered After Freezing, Lancet **1:**1350-1351 (June 23) 1951.

4. Brown, I. W., Jr., and Hardin, H. F.: Recovery and in Vivo Survival of Human Red Cells: Studies of Red Cells After Storage up to 6½ months at Subzero Temperatures, A. M. A. Arch. Surg. **66**:267-282 (March) 1953.

5. Mollison, P. L.; Sloviter, H. A.; and Chaplin, H., Jr.: Survival of Transfused Red Cells Previously Stored for Long Periods in Frozen State, Lancet **2**:501-505 (Sept. 13) 1952.

6. Lovelock, J. E.: Mechanism of Protective Action of Glycerol Against Hemolysis by Freezing and Thawing, Biochim. et biophys. acta **11**:28-36 (May) 1953.

7. Meryman, H. T.: Ice Crystal Formation in Frozen Tissues, Lecture and Review Series 53-3, Naval Medical Research Institute, March 27, 1953, pp. 1-48.

8. Tullis, J. L.; Driscoll, S. G.; and Ketchel, M. M.: Principles and Use of Cohn Fractionator in Glycerolization and Deglycerolization of Human Red Cells, in Proceedings of Conference on Plasma Proteins and Cellular Elements of Blood, Cambridge, Mass., Protein Foundation, Inc., Nov. 15, 1954, pp. 17-25.

9. Tullis, J. L., and others: New Principles of Closed System Centrifugation, Science **124**:792-797 (Oct. 26) 1956.

10. Ross, J. F.; Finch, C. A.; Peacock, W. C.; and Sammons, M. E.: In Vitro Preservation and Post-transfusion Survival of Stored Blood, J. Clin. Invest. **26**:687-703 (July) 1947.

11. Gibson, J. G., II; Rees, S. B.; McManus, T. J.; and Scheitlin, W. A.: Citrate-Phosphate-Dextrose Solution for Preservation of Human Blood, Am. J. Clin. Path. **28**:569-578 (Dec.) 1957.

12. Polge, C., and Lovelock, J. E.: Preservation of Bull Semen at −79 C, Vet. Rec. **64**:396 (July) 1952.

13. Lovelock, J. E.: Resuspension in Plasma of Human Red Blood-Cells Frozen in Glycerol, Lancet **1**:1238-1239 (June 21) 1952.

14. Sloviter, H. A.: Method for Preparing Thawed Erythrocyte-Glycerol Mixtures for Transfusion, Am. J. M. Sc. **231**:437-440 (April) 1956.

15. Gibson, J. G., II, and Scheitlin, W. A.: Method Employing Radioactive Chromium for Assaying Viability of Human Erythrocytes Returned to Circulation After Refrigerated Storage, J. Lab. & Clin. Med. **46**:679-688 (Nov.) 1955.

16. Crosby, W. H., and Furth, F. W.: Modification o Benzidine Method for Measurement of Hemoglobin i Plasma and Urine, Blood **11**:380-383 (April) 1956.

17. Crosby, W. H.; Munn, J. I.; and Furth, F. W. Standardizing Method for Clinical Hemoglobinometry, U. Armed Forces M. J. **5**:693-703 (May) 1954.

18. Zwilling, W.: Hemoglobin Toxicity Study, V Sanguinis **3**:47-50 (Jan.) 1958.

USE OF BIOMECHANICAL EQUIPMENT FOR THE LONG-TERM PRESERVATION OF ERYTHROCYTES

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Human red blood cells can be stored for three months or longer at temperatures below −80 C if they are mixed with glycerol. Before the red blood cells can be used, however, they must be washed free of glycerol. Both the initial equilibration with glycerol before storage and the removal of the glycerol from the cells after storage involve fractional centrifugation. In order to accomplish this without bacterial contamination and with a minimum of hemolysis, the apparatus here described has been developed. Experience with 175 units of red blood cells so processed showed that sterility had been maintained, loss by hemolysis did not exceed 20%, and the time required for the processing had been significantly shortened.

The long-term preservation of erythrocytes has recently become possible because of the finding that the damage to erythrocytes caused by freezing and thawing can be greatly reduced if the cells are first equilibrated with a glycerol-containing medium.[1] Studies are available which indicate that erythrocytes preserved in this manner may be used in vivo.[2] However, the removal of glycerol before transfusion is done is a laborious and time-consuming process and is difficult to perform under sterile conditions. It appears that the removal of glycerol has provided the major obstacle to long-term storage of erythrocytes on a large scale.

From their studies with closed-system mechanical devices for the handling of blood, the attention of Cohn and his collaborators[3] was drawn to the possibility that the disadvantages of the glycerol

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method could be minimized if the processing were carried out in a closed system which imposed no limitation on the volume of solutions with which the cells could be washed. A centrifuge bowl designed for this specific purpose was first demonstrated in 1954.[4] These principles were later incorporated into an apparatus known as the Cohn ADL fractionator. This apparatus, which has been described in detail elsewhere,[5] contains two refrigerated, continuous-feed centrifuge bowls. Each bowl and the parts with which the blood comes in contact may be put in the autoclave as a unit, thus permitting operation without bacterial contamination. Evidence has been presented that human red blood cells collected and separated in the machine survive as well in vivo as cells collected by conventional blood bank methods.[6] With these semiautomatic methods, the time required for the removal of glycerol is shortened, the processing can be performed without bacterial contamination, the operator can work at comfortable temperatures while the cells are refrigerated, and the obvious advantages of mechanization are present.

Methods

With 75 ml. of A. C. D. solution (National Institutes of Health formula A) used as an anticoagulant, 500-ml. units of blood were collected into plastic blood bags. The solutions used to equilibrate the cells with glycerol and to remove glycerol from the cells (table 1) were prepared and stored according to accepted procedures for human in vivo use. Frequent bacteriological and pyrogenic tests were carried out.

Table 1.—*Composition of Solutions*° *Used in Equilibration of Red Blood Cells with Glycerol and in Removal of Glycerol from These Cells*

Equilibration with Glycerol	Gm./Liter
Solution A	
Glycerol†	500.0
Sodium lactate	29.2
Potassium chloride	0.3
Glucose	2.0
Removal of Glycerol	
Solution B	
Glycerol	100.0
Sodium lactate	97.2
Potassium chloride	0.3
Solution C	
Sodium lactate†	29.1
Potassium chloride	0.3
Solution D	
Sodium chloride	8.5
Resuspension Medium	
Solution E	
Albumin	50.0
Glucose	4.0
Potassium phosphate, dibasic	3.5
adjust to 0.15 with sodium chloride	
adjust to pH 6.9 with sodium bicarbonate	

* Solutions suggested by Dr. Ivan Brown, Duke University, Durham, N. C.

† Molarity of solution calculated from manufacturer's estimate of percentage of sodium lactate in the solution.

After thorough cleaning of the centrifuge cartridge, the disposable plastic parts and the bottles containing solutions were attached. The unit as a whole was put in the autoclave for 45 minutes at a pressure of 10 lb. per inch.[2a]

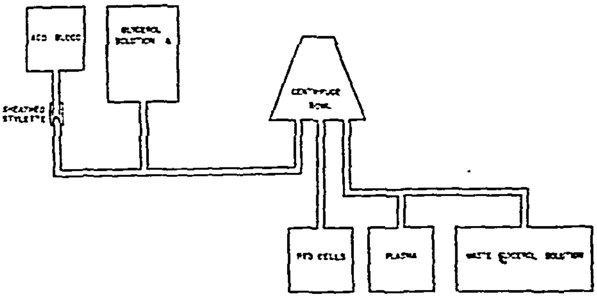

Fig. 1.—Schematic diagram of centrifuge cartridge assembly for equilibrating red blood cells with glycerol.

The plastic containers used throughout this study were equipped with plastic tubing projections. Thus, a sample of the contents of the containers could be removed, without risking contamination, by forcing some of the contents into the tubing projection and separating a length of the projection, by means of a dielectric sealer, from the container.

Equilibration of Cells with Glycerol Solution.—A schematic diagram of the centrifuge cartridge assembly for equilibrating the red blood cells with glycerol is shown in figure 1. A sheathed stylet, with which to connect the plastic blood bag and a bottle of glycerol solution share a common plastic tube which connects with the entry port of the centrifuge bowl. A plastic bag to receive the plasma during the red blood cell–plasma separation and a plastic bag to receive the waste glycerol solution are shown connected to a tube leading from the centrifuge bowl. After the washing operation is completed, the centrifuge bowl discharges its red blood cells into a separate plastic bag in which they are frozen. By sealing the plastic tubing and cutting through the seal, one may separate any of the plastic bags from the system without contaminating either the system or the contents of the bag. Slight pressures of nitrogen gas were used to force wash solutions into the centrifuge bowl. The rate of flow of blood or wash solution through the system was controlled by means of adjustable clamps on the plastic tubing. The vents for the system (not shown in diagram) were protected from bacterial contamination by means of filters.

The centrifuge cartridge, after being cooled in the fractionator, was set in operation at 5,000 rpm. With use of sterile technique, the plastic bag containing the blood-A. C. D. mixture was punctured with the sheathed stylet and the blood was forced by gravity to enter the centrifuge bowl at a rate of 50-60 ml. per minute. The red blood cells remained in the spinning centrifuge bowl, and the plasma was collected in its plastic bag.

The glycerol solution (solution A of table 1) was then allowed to enter drop-wise at a slow rate. The internal structure of the centrifuge bowl caused the glycerol solution to enter at the bottom of the bowl, rise through the cells, equilibrating with them, and spill over at the top. The waste solution then passed out of the centrifuge bowl into its plastic bag. After 100 to 200 ml. of solution A had washed the cells, the rate of flow could be increased to 40-50 ml. per minute. When the cells were equilibrated with the glycerol solution, the centrifuge bowl was stopped; allowing the red blood cells to fall into their plastic bag, and the bag was sealed off and separated from the centrifuge cartridge.

Refrigeration Equipment.—The cells were wrapped in aluminum foil as a protection against dehydration and were placed in a cardboard box to protect the plastic bag, which becomes brittle at low temperatures. The box was then placed directly in either of two storage cabinets maintained at -80 C ±2 and -120 C ±2. The -80 C unit has a two-stage compressor system, with a storage capacity of 4.8 cu. ft. The -120 C unit has a three-stage compressor system with a storage capacity of 6 cu. ft. The cabinets were equipped with an automatic temperature recording device and an alarm system which warned of temperature rises. An auxiliary generator was available in the event of power failure.

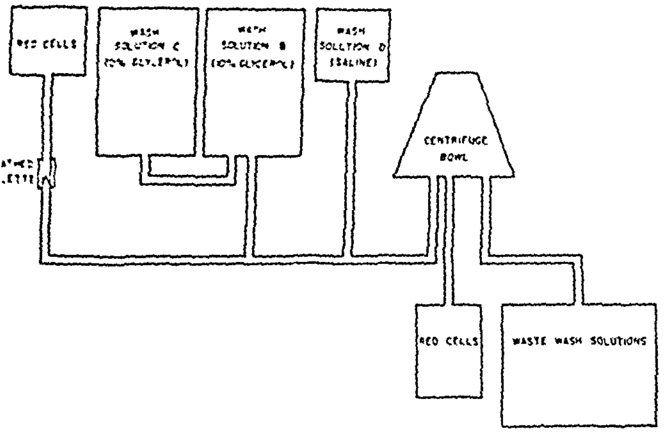

Fig. 2.—Schematic diagram of centrifuge cartridge assembly for removal of glycerol from red blood cells.

Removal of Glycerol Solutions.—On removal of a unit of cells from the low-temperature cabinets, the plastic bag containing the cells was placed in a water bath at 37 C. As soon as the cells were thawed, the bag was punctured through a sterile sheath with a stylet, and the cells forced into the centrifuge bowl, which was spinning at 4,000 rpm. It is important that the cells be removed from the water bath as soon as they are thawed (about 15 minutes), in order to avoid cellular deterioration.

A schematic diagram of the centrifuge assembly for the removal of glycerol from the red blood cells is shown in figure 2. A sheathed stylet with which to connect the plastic bag containing the red blood cells and three separate bottles of wash solution share a common plastic tube which connects with the entry port of the centrifuge bowl. A waste bag to receive the used wash solution is shown connected to a tube leading from the centrifuge bowl. After the washing operation is completed, the centrifuge bowl discharges its contents of red blood cells into a plastic administration bag.

The tandem arrangement of the bottles containing wash solutions B and C (fig. 2) provided a gradual rather than an abrupt change in the tonicity to which the cells were subjected. As shown in table 1, solution B had a relatively high tonicity, while solution C was isotonic for red blood cells. When the cells were in the centrifuge bowl, solution B was allowed to enter drop-wise, and this rate could be gradually increased to 20 to 30 ml. per minute. After 1 liter of solution B had entered the bowl, a clamp between the bottles containing solution C and solution B was released. Thus, as each drop of solution B left its bottle, it was replaced by a drop of solution C. Since the density of solution C was less than that of solution B, the drops of solution C tended to rise. Finally, the remaining liter of solution C was washed through the cells.

When both solutions B and C had passed through the centrifuge, 1 liter of solution D (0.85% sodium chloride) was passed through. The centrifuge was stopped, and the cells dropped into a plastic container labeled "red cells" (fig. 2). This bag contained 60 ml. of solution E and the resuspension medium in which the cells were stored until transfused. Since this solution contained a protein, the bag in which it was contained was not put in the autoclave with the centrifuge cartridge but was attached, with use of aseptic technique, just before the centrifuge was stopped.

Determination of Glycerol Concentration.—The quantity of glycerol contained in the cell suspensions was determined by a modification of the spectrophotometric method of Karnovsky.[7] A sample of a red blood cell suspension which had not been equilibrated with glycerol was used as a blank, and the difference was attributed to the glycerol.

Determination of Cell Lysis.—The amount of a cell suspension which was lysed during processing was estimated by determining the amount of hemoglobin in the wash solutions. Hemoglobin level determinations in the wash solutions were made from readings on a Coleman junior spectrophotometer set at 455 mμ. A standard curve was plotted from dilutions of lysed red blood cells, and values of hemoglobin in unknown solutions were derived by comparison.

Bacteriological Studies.—Each unit of cells was tested for bacterial contamination after being equilibrated with glycerol and after removal of the glycerol. By sealing off a plastic tubing projection of the plastic container, it was possible to obtain a sample of the contents of the container without danger of contamination of the remaining cells. For each sample tested, three Sabouraud's medium slants, three blood agar plates, and three tubes of thioglycollate glucose broth were inoculated. Cultures of each of the three mediums were incubated at 4 C, at room temperature, and at 37 C.

Results

The present report is concerned with units of red blood cells which were processed in the period from November, 1955, to July, 1956. During this time, 175 units of cells were frozen either at −80 or at −120 C. Fifty units have been used for in vitro evaluation studies. A separate report[8] is concerned with in vivo evaluation of these cells. The remainder of the units will be evaluated as they reach appropriate times in storage.

Bacteriological Studies.—In two cases, breaks occurred in the plastic storage containers due to the brittleness of the plastic at low temperatures. After the removal of glycerol, bacteriological testing produced positive cultures.

In tests made on 175 units of cells after equilibration with glycerol, and again on 47 of these units after the removal of glycerol, no further positive cultures were obtained. Further evidence of the absence of bacterial contamination during processing is obtained from the observation that no pyrogenic reactions occurred in patients receiving these cells.

Time Required for Processing.—The equilibration with glycerol of a unit of red blood cells requires from 45 to 50 minutes in the Cohn-ADL blood fractionator. The removal of glycerol requires from 90 to 120 minutes in the fractionator.

Recovery of Cells.—The percentage of cells which are lysed by the equilibration with glycerol and by the removal of glycerol was determined by a measurement of the hemoglobin level contained in wash solutions after the cells were processed. The results of such determinations both after equilibration with glycerol and after removal of glycerol are shown for three units of cells in table 2. The equilibration of the cells with glycerol resulted in a loss of from 1.1 to 1.8% of the total cells. From 9 to 12% of the total cells were recovered as hemoglobin in the wash solution used to remove the glycerol from the cells. It should be emphasized that this latter loss not only is a result of the removal of glycerol but also includes the loss of those cells which are lysed or injured by freezing and thawing. Since the units recorded in table 2 were in storage for one month or less, losses occurring as a result of length of time in storage are not a factor.

Losses of cells as intact cells, when being transferred from container to centrifuge bowl, and in other transfers, as cells used for cross-matching and serology, and as cells used in bacteriological testing account for approximately 8 to 10% of the original cells. Added to the losses occurring as a result of equilibration with glycerol and removal of glycerol, a total loss of approximately 20% of the cells occurs.

Removal of Glycerol from Cell Suspension.—Samples of eight units of cells were tested after the removal of glycerol to determine the amount of glycerol that was not removed from the cells by the processing. In all eight units, the glycerol content was found to be less than 1 Gm. per 100 cc.

Reliability of Refrigeration Equipment.—A constant consideration during the course of these experiments concerned the feasibility of maintaining the temperatures of −80 and −120 C, at which the cells are stored. Three failures of the equipment occurred. In one, a power failure in the lines of the local utility company resulted in a rise in temperature to −60 C. A further rise in temperature was prevented by placing solid carbon dioxide in the storage cabinet. Recurrence of this type of failure has been prevented by the installation of an emergency generator.

In two other failures mechanical breakdowns occurred in the compressors. The prompt attention of mechanics prevented these failures from resulting in significant temperature rises. It is unnecessary to open the storage cabinets in order to repair the compressors, so the heavy insulation of the cabinets prevents rapid rises in temperature when mechanical failures occur.

TABLE 2.—*Percentage of Cells Lost in Each Stage of Processing*

Time in Storage, Days	Equilibration with Glycerol	Removal of Glycerol*	Total
4	1.8	10	11.8
7	1.8	12	13.8
30	1.1	9	10.1
Total			35.7
Av.			11.9

* Including cells hemolysed by freezing and thawing.

No special significance was attached to the temperature at which cells were stored in these experiments. Since much work on the freezing of cells has been carried out at the temperatures of solid carbon dioxide, one cabinet was designed so that it would operate near −79 C. The cabinet was found to run at −80 C and was not adjusted. The temperature of −120 C was chosen in conference with the manufacturer of the equipment as his estimate of a temperature which could be obtained with practical equipment.

Comment

The principal objective of this study was to establish a set of results, obtained from a sufficient number of experiments, against which future improvements in the present method could be compared. Future reports concerning the cells now in storage will add more such data. The composition of the wash solutions, the volume of wash solutions, and the rate of washing might all be modified so that a shorter time for processing and improvement in the number and quality of recovered cells would result.

In the present study, 90 to 120 minutes in the Cohn ADL blood fractionator was required to remove the glycerol from each unit of cells. This is a considerable reduction in the time required by conventional centrifuge methods. The standard model of the Cohn ADL blood fractionator consists of two centrifuge units, and, whenever required in the present study, two units of cells were processed in the machine simultaneously by the same operator, thus reducing the unit time by one-half. If a large-scale program were considered, a series of centrifuge units could be arranged so that a trained operator and an assistant would be able to process a large number of units simultaneously. In this manner, the time required per unit of cells could be greatly reduced.

Perhaps of significance to others interested in low-temperature storage is the record of performance of equipment operating at -80 and -120 C. Power failures can be met by an emergency generator. Placing the mechanical parts of the equipment in a position so that they can be repaired without opening the storage cabinet takes advantage of the heavy insulation in slowing the temperature rise. Although full confidence must await longer trials, performance in our laboratory indicates that temperatures as low as -120 C may be maintained satisfactorily for long periods.

Summary

A method for the equilibration of red blood cells with glycerol and for the removal of glycerol from these cells, utilizes the Cohn ADL blood fractionator. In periods of storage from one day to three months, an average of 80% of the donor cells were available for transfusion into three recipients. Except in known instances of breaks in sterility, no bacterial contamination was observed.

The equilibration of a unit of cells with glycerol requires 45 to 50 minutes in the Cohn ADL blood fractionator, and the removal of glycerol requires 90 to 120 minutes. Temperatures were adequately maintained at -80 C and -120 C with mechanical equipment. Losses of cells from equipment failure did not occur.

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This study was carried out under contract with the Office of Naval Research, Department of the Navy, with funds supplied by the research and development departments of the U. S. Navy, Army, and Air Force.

The storage cabinets used in this study were designed, constructed, and maintained by the Harris Refrigeration Company, Cambridge, Mass.

References

1. Smith, A. U.: Prevention of Hæmolysis During Freezing and Thawing of Red Blood-Cells, Lancet **2:**910-911 (Dec. 30) 1950.

2. (*a*) Sloviter, H. A.: In-Vivo Survival of Rabbit's Red Cells Recovered After Freezing, Lancet **1:**1350-1351 (June 23) 1951. (*b*) Brown, I. W., Jr., and Hardin, H. F.: Recovery and in Vivo Survival of Human Red Cells: Studies of Red Cells After Storage up to 6½ Months at Subzero Temperatures, A. M. A. Arch. Surg. **66:**267-282 (March) 1953. (*c*) Mollison, P. L.; Sloviter, H. A.; and Chaplin, H., Jr.: Survival of Transfused Red Cells Previously Stored for Long Periods in Frozen State, Lancet **2:**501-505 (Sept. 13) 1952.

3. Cohn, E. J.; Surgenor, D. M.; Tullis, J. L.; and Driscoll, S. G.: Biomechanical Equipment for Collecting and Processing All Parts of Blood to Stable States, in Proceedings of Conference on New Knowledge About Proteins and Cells, University Laboratory of Physical Chemistry, Harvard Medical School, Jan. 15, 1953. p. 1.

4. Tullis, J. L.: Principles Involved in Glycerolization and Deglycerolization of Red Cells Using Cohn Fractionator, in Proceedings of Conference on Plasma Proteins and Cellular Elements of Blood, Protein Foundation, Nov. 4, 1954, p. 17.

5. Tullis, J. L., and others: New Principle of Closed System Centrifugation, Science **124:**792-797 (Oct. 26) 1956.

6. Gibson, J. G., II.: In-Vivo Survival Studies on Packed Red Cells Separated in Cohn Fractionator, in Proceedings of Conference on Plasma Proteins and Cellular Elements of Blood, Protein Foundation, Nov. 4, 1954, p. 12.

7. Karnovsky, M. L., and Brumm, A. F.: Studies on Naturally Occurring α-Glycerol Ethers, J. Biol. Chem. **216:**689-701 (Oct.) 1955.

8. Tullis, J. L., and others: Studies on in-Vivo Survival of Glycerolized and Frozen Human Red Cells, J. A. M. A. **168:**399-404 (Sept. 27) 1958.

PEPTIC ESOPHAGITIS.—Cholecystectomy for cholelithiasis was performed in four patients without relief of symptoms. In one patient, subsequent sphincterotomy for a presumptive diagnosis of biliary dyskinesia also failed to relieve the symptomatology. Gastroenterologic examination from one to eight years later revealed hiatus hernia (sliding) with peptic (reflux) esophagitis. Medical therapy produced symptomatic relief in three patients, while one required surgical intervention for repair of the hernia. The "postcholecystectomy syndrome" is in some instances a result of inadequate preoperative investigation. Peptic esophagitis may be responsible for the symptoms of a patient with calculous disease of the gall-bladder whenever heartburn and sour regurgitation appear prominent in the clinical picture. In these patients the decision to operate for gall-bladder disease should be an indication for barium meal study. The high incidence of silent, calculous gall-bladder makes such clinical investigation mandatory to avoid some of the failures of gall-bladder surgery.—A. I. Friedman, M.D., Peptic Esophagitis Simulating the "Postcholecystectomy Syndrome," *Annals of Internal Medicine*, July, 1958.

CLINICAL NOTES

TUBELESS GASTRIC ANALYSIS

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The tubeless detection of gastric acidity, as developed by Segal and associates,[1] makes it possible to ascertain the state of gastric acidity in specific cases or in mass screening examinations without the use of complicated or cumbersome chemical procedures. The rationale of tubeless analysis depends on the use of a dye, azure A, which is released from a cation exchange resin by free hydrochloric acid in the stomach. In the presence of free acid, the free dye is absorbed and consequently excreted in the urine and the blue color of the urine may then be visually compared with a solution of azure A of known concentration.

It has been reported by other workers [2] that in about 50% of the tests the azure A is excreted in a reduced, colorless form that requires oxidation with acid and heat to bring out the color. In our experience, about 75% of the positive samples require oxidation. Since azure A is a thionine dye similar to methylene blue, it is easily reduced with ascorbic acid in acid or alkaline solution. The presence of ascorbic acid and reductone in urine is probably responsible for the excretion of azure A in the colorless, reduced form. The ease with which ascorbic acid reduces the azure A makes it possible to use the test urine sample as its own control, thus eliminating the collection of a control sample.

Methods and Materials

The highly satisfactory modified test, in use in this laboratory for about one year, is as follows: Patients in the fasting state are given two tablets (0.5 Gm.) of caffeine and sodium benzoate by mouth with one-half glass of water. The patient is permitted to urinate at will. One hour later, the bladder is emptied and the urine discarded. The patient is given the azure A granules with one-half glass of water, and all the voided urine is collected for the next two hours.

For analysis, the urine sample is diluted to 300 ml. To about 15 ml. of the diluted sample in a large test tube, two drops of oxidizing reagent (200 mg. of copper sulfate in 100 ml. of 18% hydrochloric acid) are added; this is placed in a boiling water bath for 10 minutes. It is then allowed to cool to room temperature for two hours. Samples that are not obviously positive are divided into two portions in test tubes. To one tube a pinch (300 mg.) of ascorbic acid is added and mixed to reduce the dye. The oxidized and reduced samples are compared with the 0.3-mg. and 0.6-mg. azure A standards.

Results

In 32 patients who secreted free hydrochloric acid and in 10 with hypochlorhydria or achlorhydria, most of whom were ambulatory, the simplified procedure yielded results identical with the more complicated control and test urine sample technique. Since the test sample contains the pigments of urine collected over a two-hour period, as compared with the one-hour control sample, most of the test samples, reduced with ascorbic acid, appeared darker than the control.

In three other cases the diagnosis was altered from hypochlorhydria to achlorhydria when the test sample was used as its own control. In one patient with proteinuria, the azure A test was obviously invalidated and required standard intubation techniques for evaluation.

Conclusions

As a mass screening procedure for the diagnosis of pernicious anemia, gastric cancer, and duodenal ulcer, the tubeless analysis for gastric acidity is a useful technique. The elimination of the control sample simplifies the procedure in that one urine sample serves for both the test and the control. For the busy clinic, hospital, or office, a single urine sample decreases the effort of monitoring samples on many patients. In addition, the single urine collection makes instructions to the patient simpler and avoids the need for retesting due to inadequate sampling.

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The azure A resin compound used in this study was supplied as Diagnex Blue by E. R. Squibb & Sons, New York.

References

1. Segal, H. L.; Miller, L. L.; and Plumb, E. J.: Tubeless Gastric Analysis with Azure A Ion-Exchange Compound, Gastroenterology **28**:402-408 (March) 1955.

2. Gilbert, S. S.; Matzner, M. J.; and Schwartz, I. R.: Tubeless Gastric Analysis: Evaluation of (Diagnex Improved) Azure A Carboxylic Resin, Am. J. Gastroenterol. **27**:277-284 (March) 1957. Rechtschaffen, J. S.; Venet, L.; and Weingarten, M.: Gastric Acidity Determination Procedures: Comparison of Tubeless Method with Azure A Resin Compound and Intubation Method with Histamine, J. A. M. A. **164**:1467-1468 (July 27) 1957.

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POTENTIATION OF ANTIHYPERTENSIVE THERAPY BY USE OF CHLOROTHIAZIDE

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Although chlorothiazide (Diuril) was initially introduced as an orally given diuretic,[1] subsequent clinical trial readily revealed this agent to possess significant antihypertensive properties. In 25 patients moderate hypertension had been somewhat less than adequately controlled for a period of at least six months with Rauwolfia (Raudixin) alone. In another 25 patients it had been inadequately controlled for a similar period with a regimen of Rauwolfia and mecamylamine (Inversine). Chlorothiazide (500 mg. after breakfast and lunch) was added to the therapeutic regimen of each patient.

In the first group of patients, the upright mean blood pressure was reduced from the control level of 131 mm. Hg to 109 mm. Hg ($p<0.01$) after 12 weeks of chlorothiazide therapy. A contemporary decrease in body weight became significant at the end of 12 weeks (table 1). In the group of patients receiving a drug combination of Rauwolfia and mecamylamine, the mean blood pressure in the upright position was reduced from the control value of 139 mm. Hg to 102 mm. Hg ($p<0.001$) after 12 weeks of chlorothiazide therapy. A contemporary decrease in body weight occurred (table 1).

TABLE 1.—*Average Effect of Chlorothiazide in Augmenting Antihypertensive Therapy in Two Groups of Patients**

	Blood Pressure, Mm. Hg†			Wt., Lb.	p Value‡
	Lying	Standing	p Value		
Twenty-five Patients Receiving Rauwolfia					
Control period	188/108(135)	174/110(131)		172	
After 3 wk. of therapy	170/99 (123)	155/96 (116)	<0.01	171	NS
After 6 wk. of therapy	160/95 (117)	148/91 (110)	<0.001	171	NS
After 12 wk. of therapy	166/93 (117)	147/90 (109)	<0.001	171	<0.01
Twenty-five Patients Receiving Rauwolfia and Mecamylamine					
Control period	201/121(148)	169/109(139)		160	
After 3 wk. of therapy	182/110(131)	150/97 (115)	<0.001	160	NS
After 6 wk. of therapy	172/101(127)	139/93 (108)	<0.001	159	<0.01
After 12 wk. of therapy	167/102(124)	132/87 (102)	<0.001	158	<0.01

* Chlorothiazide given in dosage of 500 mg. twice daily orally.
† Numbers in parentheses give mean blood pressure, which equals diastolic plus one-third pulse pressure.
‡ p Value derived from Student's "t" test applied to standing mean blood pressure between drug and control periods.

With addition of chlorothiazide to the Rauwolfia antihypertensive regimen, approximately 20% of the patients evidenced a decrease in blood pressure associated with a gain in weight, while the largest group of patients (41%) showed a decrease in blood pressure associated with either a steady weight or slight weight reduction as a manifestation of diuresis (table 2). The correlation of body weight changes and the changes in blood pressure associated with addition of chlorothiazide to the combination Rauwolfia-mecamylamine antihypertensive regimen was essentially the same as with the former group (table 2).

Comment

Although the results of this study further define the hypotensive properties of chlorothiazide, the fundamental problem of the mechanism of this response is still not fully apparent. We[2] have recently shown that the potentiation of antihypertensive agents is a property common to all effective diuretics and that the degree of potentiation seen is a reflection of the relative potency (as manifested by enhanced sodium excretion as well as decreased body weight) of the diuretic. It would appear that the encouraging results to date with chlorothiazide in the treatment of hypertension are due to the fact that it has a high relative diuretic potency and continues to be effective on repetitive administration. Though a direct antihypertensive effect cannot be excluded, present evidence suggests that the blood pressure responses seen with the use of chlorothiazide in hypertension are a result of its diuretic effect.

TABLE 2.—*Correlation of Changes in Blood Pressure and Body Weight in Antihypertensive Regimens After Addition of Chlorothiazide*

	Rauwolfia		Rauwolfia-Mecamylamine	
	No.	%	No.	%
Increase				
Wt. gain	3	4	6	8
No wt. gain	6	8	7	9
Decrease				
Wt. gain	15	20	12	16
No wt. gain	31	41	30	40
No change				
Wt. gain	5	7	4	5
No wt. gain	15	20	16	22
Total*	75	100	75	100

* Observations on 25 patients in three drug periods.

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The chlorothiazide used in this study was supplied as Diuril, and the mecamylamine as Inversine by Merck Sharp & Dohme Research Laboratories, West Point, Pa.; the Rauwolfia used, as Raudixin by E. R. Squibb & Sons, New York.

References

1. Ford, R. V.; Moyer, J. H.; and Spurr, C. L.: Clinical and Laboratory Observations on Chlorothiazide (Diuril): Orally Effective Nonmercurial Diuretic Agent, A. M. A. Arch. Int. Med. **100:**582-596 (Oct.) 1957.
2. Ford, R. V.; Bullock, A. C.; and Rochelle, J. B.: Effect of Diuretics as Antihypertensive Agents, GP, to be published.

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ANOMALOUS CASE OF EDEMA, ANASARCA, AND POLYSEROSITIS

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Recently, we have had occasion to study another case of anomalous edema, characterized by a slowly progressive downward course ending in anasarca, polyserositis, and death. The diagnosis in life was indeterminate despite several months spent in the hospital and innumerable laboratory tests. Clinical studies and autopsy examination excluded all the ordinary causes of edema (diseases of heart, liver, kidneys, and blood) and also more unusual syndromes.

It is thought that this case may represent a new syndrome similar in part to three others previously reported by one of us,[1] representing a disease that is the antithesis of diabetes insipidus, characterized by salt and water retention and postulated as possibly due to "hyperpitressinism." If it does, then it represents a fulminating form of the same, and our first autopsy report of such a case.

Report of a Case

A 39-year-old female had noted gradual onset of periorbital, scalp, and ankle edema in the fall of 1954. Her weight rose from 135 lb. (61.2 kg.) in September, 1954, to 155 lb. (70.3 kg.) in February, 1955. She had noticed no change in thirst, desire for salt, frequency of urination, or marked fluctuations in her edema or weight. In 1937 her left fallopian tube and an ovarian cyst had been removed. For two years her menstrual periods had been irregular, and for one year she had had infrequent "hot flashes." In January, 1955, her local doctor had informed her of a "left pelvic mass."

On her initial hospitalization in February, 1955, she displayed edema of the scalp, periorbital areas, and ankles. Physical examination was otherwise negative except that attempts at pelvic examination were unsuccessful. The patient's blood pressure was 118/72 mm. Hg. Abnormal levels of blood pressure were never obtained.

Numerous laboratory studies were performed, with normal results being obtained (see table). Her edema partially subsided, and she was discharged from the hospital in April, 1955, weighing 149 lb. (67.6 kg.).

While at home she had gradual weight gain without noting change in water or salt intake or urine output. On readmission to the hospital on June 12, 1955, she weighed 168 lb. (76.2 kg.). Edema of the face and scalp, distended cervical veins, engorged breasts, bilateral pleural effusion, ascites, and marked edema of the lower abdominal wall and lower extremities were present. The heart sounds, rate, and rhythm were normal. Pelvic examination was again unsatisfactory.

Until her death on Jan. 7, 1956, there was slowly progressive anasarca, with distressing accumulations of fluid in serous cavities and subcutaneous tissue. Repeated laboratory diagnostic studies were performed without a clue as to diagnosis. Pleural, pericardial, and peritoneal fluid was removed on several occasions, in total amount over 20 liters; the fluid was normal on cytological, culture, and smear study, as well as on study of several guinea pig inoculations. Catheterization of the right side of the heart was performed on Nov. 10, 1955, at the National Children's Cardiac Hospital. Findings failed to reveal any disturbance in measurable cardiac physiology.

Attempts to control the fluid accumulation with the usual diuretic measures (ammonium chloride, acetazolamide [Diamox], potassium chloride, mercaptomerin [Thiomerin] sodium, and meralluride [Mercuhydrin] sodium) were at times transiently and only partially successful. Digitalization on two occasions and administration of ACTH and prednisone on other occasions were without apparent benefit. Gradually all diuretic measures were to no avail, and she became weaker and apathetic; without developing new signs or symptoms she lapsed into coma and died on Jan. 7, 1956.

Laboratory Data of Patient with Edema Followed by Anasarca and Polyserositis

Test	During First Admission	During Second Admission
Hemoglobin level, Gm. %	13.5	13–15.5 (range of 11 determinations)
White blood cell count, per cu. mm.	9,450, normal differential	7,650-16,250 (range of 13 determinations); normal differential
Urine: specific gravity	1.016	1.002–1.022 (range of 17)
Albumin	Negative	Faint trace (maximum of 17)
White blood cells per high-power field	0-2	1-3–10-15 (range of 17)
Sugar	Negative	Negative
24-Hr. protein, mg.	...	50–136 (range of 5)
Maximum concentration	1.018	...
Maximum dilution	1.001	...
Sodium excretion, mEq./24 hr.	...	3.13–312
Potassium excretion, mEq./24 hr.	...	3.74–172
Chloride excretion, mEq./24 hr.	...	25.3–492
Phenolsulfonphthalein excretion, min.	18% at 15; 36% at 30	...
Urea clearance, % of normal	82	39 (9/13/56)
Urine culture	Negative	Negative five times
Serum calcium level, mg. %	11	...
Serum phosphorus level, mg. %	4.2	...
Serum bilirubin level, mg. %	...	0.6
Urea nitrogen, mg. %	17	6–22 (range of 15)
Thymol turbidity, units	...	2.5
Cephalin flocculation	...	Negative in 48 hours
Cholesterol, mg. %	254	175
Alkaline phosphatase level, Bodansky units	...	4.6
Prothrombin time, % of normal	...	100
Congo red, % absorption in 65 min.	...	23
L. E. cells	...	Negative four times
Sodium, mEq./liter	...	126–136 (range of 17)
Potassium, mEq./liter	...	2.47–6 (range of 17)
Chloride, mEq./liter	...	90–107 (range of 17)
CO_2, mEq./liter	...	28–36 (range of 17)
Culture for fungus and acid-fast organisms of pleural fluid	...	Negative four times
Thyroid I^{131} uptake, % at 24 hr.	19 (euthyroid)	
Electrocardiogram	Normal	Low voltage T waves, consistent with anasarca
Roentgenologic studies:		
Chest	Within normal limits	Bilateral pleural effusion
Skull	Normal	
Intravenous pyelogram	Within normal limits	

Laboratory Data.—During her hospitalization the patient had many laboratory studies performed, and the laboratory data are summarized in the table. Her urinary sodium output

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From the medical service, Veterans Administration Hospital (Drs. Rowntree, Winter, and Brown) and the Howard Hughes Medical Institute (Dr. Boucek).

for a three-week period during her last admission varied from 0.13 mEq. per 24 hours to 312 mEq. per 24 hours. There were similar wide ranges in potassium excretion (from 3.74 mEq. per 24 hours to 172 mEq. per 24 hours) and chloride excretion (from 25.3 mEq. per 24 hours to 492 mEq. per 24 hours). The low values coincided with episodes of oliguria and weight gain (water retention), while the high values occurred after the administration of diuretics and consequent diuresis. Electrocardiograms showed low voltage consistent with marked edema.

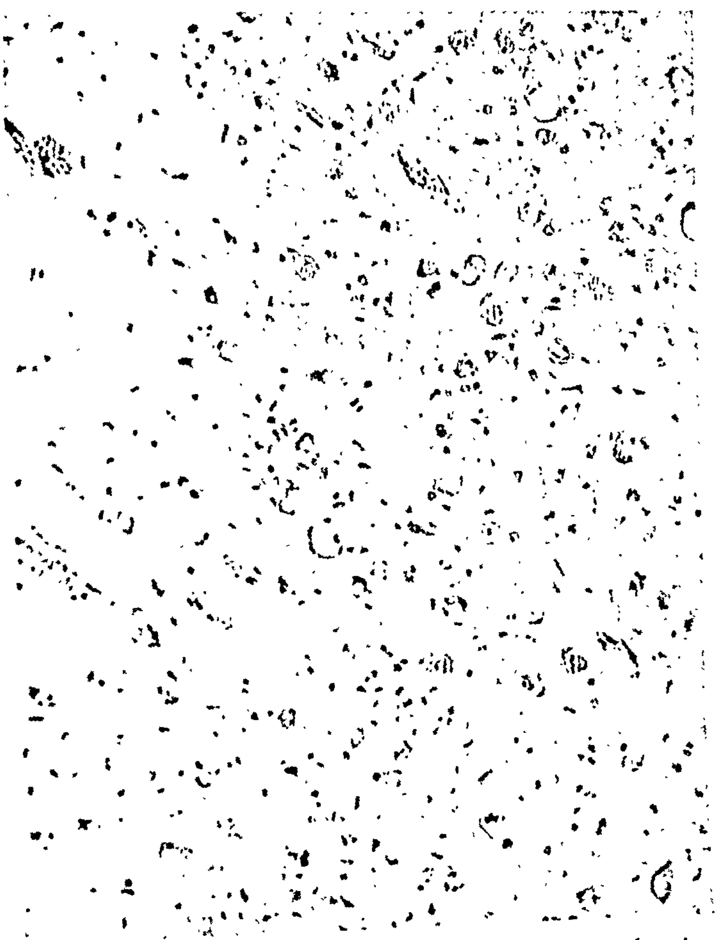

Fig. 1.—Low-power view of supraoptic nucleus, showing numerous vacuolated nerve cells (hematoxylin-eosin stain, × 136).

Repeated chest x-ray examinations showed massive bilateral hydrothoraces, which varied with thoracentesis and a presumed hydropericardium. Biopsy of the gum was normal. Biopsy of the skin from the legs was normal. Biopsy of the upper abdominal skin was normal; except for a small vein with an organized thrombus, no diagnosis could be made. Results of repeated Congo red tests for amyloidosis were negative.

Autopsy.—The following gross findings and microscopic findings were made at autopsy.

Gross Findings: The body was well developed but there was an extreme degree of waterlogging of the subcutaneous tissue of the upper and lower extremities and the trunk, so much so that each incision became immediately the site of an outpouring of water. There was no edema of the face. The breasts were atrophic. Approximately 2,000 ml. of turbid fluid was present in each pleural cavity and 500 ml. of dark brown fluid in the pericardial sac. Clear serous fluid (1,500 ml.) filled the peritoneal cavity. Both lungs were pushed upward and the lower lobes were almost completely collapsed. There was very little edema of the upper lobes. The pericardial sac was thickened, and a delicate ball and chain-like fibrinous adhesion was attached to the anterior wall of the left ventricle. Showers of petechiae were distributed about the base of the heart. The myocardium, valve leaflets, and coronary arteries were normal. The pelvic cavity was considerably obliterated by old adhesions in which the cervical stump of the uterus was embedded. A nodular mass, containing several small multiloculated cysts, some filled with old blood, and a shrunken ovary occupied the left parametrium. The thyroid and adrenal glands were grossly normal. Several small shallow ulcers were found in the duodenum overlying the head of the pancreas. The liver, pancreas, spleen, and kidneys showed no gross abnormalities. The gross appearance of the brain was normal.

Microscopic Findings: Many of the nerve cells in th supraoptic and paraventricular nuclei of the hypothalamu contained large cytoplasmic vacuoles which distended an distorted the cell bodies, often displacing the nuclei to th periphery (fig. 1). In some of the vacuoles, a pale colloi like material, which stained faintly with hematoxylin-eos stain and Gomori's chrome-alum hematoxylin stain, w visible (fig. 2). An occasional cell in the paraventricu nuclei contained a single large red cytoplasmic droplet se only with the Gomori stain. Basophilic cytoplasmic granu morphologically similar to neurosecretory material w demonstrated with the Gomori stain in many, but not all, the nerve cells in the supraoptic nuclei. These bore the nerve cells in the cytoplasmic vacuoles. Histologically, pituitary appeared normal, and scattered coarse basoph droplets were demonstrated in the posterior lobe with chrome-alum hematoxylin stain.

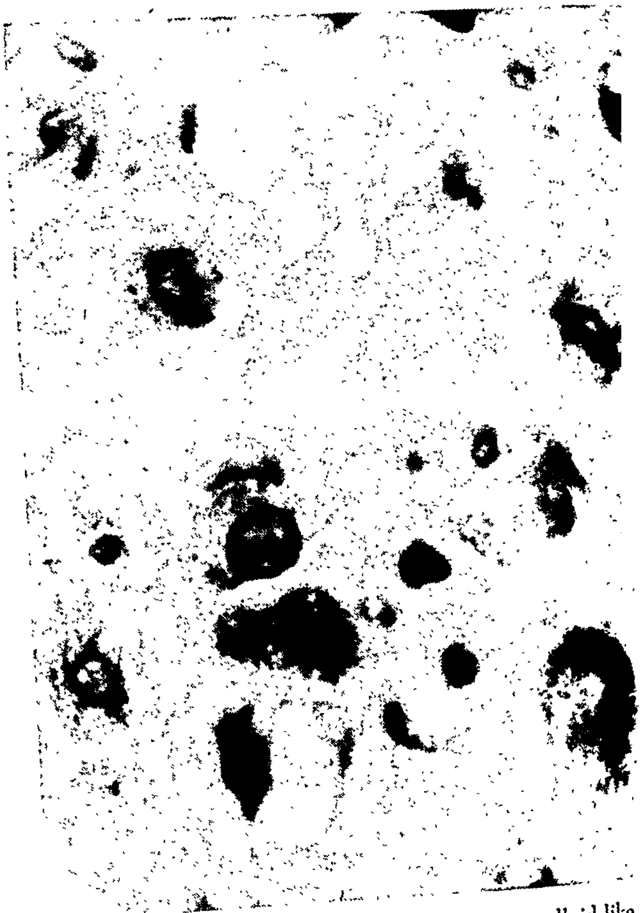

Fig. 2.—Supraoptic nerve cells, showing colloid-like m terial within cytoplasm and vacuolation (hematoxylin-eo stain, × 435).

Since the vacuolar changes in the supraoptic nuclei were so pronounced in this case, an attempt was made to compare the incidence of such changes in these nuclei with changes in patients with edema of known etiology. In five patients with portal cirrhosis with severe ascites and one patient with chronic glomerulonephritis with anasarca no such vacuolar changes were found in the supraoptic nuclei. On the other hand five autopsied patients who died of carcinoma, cerebral arteriosclerosis, and lymphoma without edema showed vacuoles in the supraoptic nuclei, but only within a very few cells in each patient. The significance of the marked vacuolation in this case was, of course, obscure, but the impression was gained that there was some relation, perhaps causal, to the profound disturbance in water and salt balance. In support of this idea is the observation of Leveque,[2] who described somewhat similar vacuolar changes in the supraoptic nuclei of rats subjected to sodium chloride overloading.

In the atelectatic portions of the lungs the alveolar walls were somewhat thickened by an increase of the reticular fibrils. The liver architecture was normal. The thyroid showed variation in size of acini, most being small and containing poorly stained, granular and inspissated colloid, while the lining cells were low and cuboid. Histologically, the adrenal was normal; the cells of the zona fasciculata were filled with lipid. The bone marrow had a normal cellularity, although there was a definite increase of eosinophilic granulocytes. The kidney structures were normal, except for an albuminous exudate in many of the glomerular spaces. The stump of the uterus was lined by atrophic endometrium. The left ovary contained a number of corpora albicantia, one of which was cystic and filled with old blood pigment. The peritoneal surface was thickened with fibrous tissue.

Comment

Diabetes insipidus is thought to be due to a deficiency of the secretion of the antidiuretic hormone, emanating from the neurohypophysis.[3] A documentary proved case of hypersecretion of the antidiuretic hormone by the neurohypophysis has yet to be reported. However, in a recent case reported by us,[1b] the suggestion was made that fluid and salt retention noted in a patient as a late complication of encephalitis may have resulted from an oversecretion of this hormone and in reality be the antithesis of diabetes insipidus. In 1922, 1929, 1933, and 1943 various authors [4] have reported upon anomalous water and salt retention and suggested that these may have represented the antithesis of diabetes insipidus.

In our recently reported case [1b] evidence was presented suggesting a disturbed red blood cell, sodium, and potassium relationship. It was suggested that the "redox sodium pump mechanism" (oxidation-reduction cycle) might be influenced by a neurohypophysial lesion. Recently, Friedman and co-workers [5] have demonstrated that the administration of vasopressin (Pitressin) to nephrectomized rats caused a movement of sodium and water into cells, accompanied by a loss of cellular potassium, indicating a cellular membrane response to vasopressin. The cellular electrolyte aberrance induced in rats by the administration of vasopressin was similar in many respects to that which we reported existing in our patient with postencephalitis and representing a possible antithesis of diabetes insipidus. The case included in this report may represent a variation of this syndrome. Hydrocatochosis might be used as a general term signifying water retention in the body. The case reported would be classified as hypothalmic hydrocatochosis. The secretory granules containing the antidiuretic hormone are formed in the cells of the supraoptic nuclei and presumably transmit the material through the stalk of the posterior pituitary gland, where it is stored.[6] The widespread histological changes noted in the neurosecretory cells of the hypothalamus may be of primary importance in the etiology of this patient's disturbed salt and water metabolism.

Conclusions

In a patient with anomalous edema, the condition ran a downward course, ending in generalized anasarca and polyserositis. Autopsy excluded all the commonly recognized diseases associated with edema. Marked histological changes which may possibly be of pathogenic significance were encountered in the cells of the supraoptic nuclei.

1241 DuPont Bldg., Miami 32 (Dr. Rowntree).

References

1. (*a*) Rowntree, L. G., and Brunsting, L. A.: Water or Fat? Water Retention in So-Called Endocrine Obesity, Endocrinology **17**:377-382 (July-Aug.) 1933. (*b*) Rowntree, L. G.; Boucek, R. J.; and Noble, N. L.: Anomalous Type of Salt and Water Retention with Persistent Edema, J. A. M. A. **161**:877-879 (June 30) 1956.

2. Leveque, T. F.: Changes in Neurosecretory Cells of Rat Hypothalamus Following Ingestion of Sodium Chloride, Anat. Rec. **117**:741-757 (Dec.) 1953.

3. Van Dyke, H. B.: Regulation of Water Excretion by Neurohypophysis, Bull. New York Acad. Med. **29**:24-33 (Jan.) 1953.

4. Veil, W. H.: Primary Oliguria, Deutsches Arch. f. klin. med. **139**:192-211 (May) 1922. Parhon, C. I., and Parhon-Stefanesco, C.: Sur un nouveau syndrome hyperhypophysaire: le nanisme hyperhypophysaire, Rev. belge sc. méd. **2**:336-340 (April) 1930. Grassheim, K.: Über "primäre Oligurie," ihr Wesen und die Ursachen ihrer Entstehung, Ztschr. f. klin. Med. **110**:469-505, 1929. Kourilsky, R.: Mechanism de la retention d'eau dans l'obesite hypophysaire avec oliguria permanente in Sur le diabète insipide, Bull. et mém. Soc. méd. d. hôp. de Paris (nos. 30-33) **58**:414-415 (Jan. 27) 1943.

5. Friedman, S. M.; Nakashima, M.; and Friedman, C. L.: Extrarenal Effects of Intravenous Pitressin in Nephrectomized Rats, Circulation Res. **4**:557-564 (Sept.) 1956.

6. Bargmann, W., and Scharrer, E.: Site of Origin of Hormones of Posterior Pituitary, Am. Scientist **39**:255-259 (April) 1951.

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How does a person's visual deficiency influence his ability to live a normal life? How do you evaluate the degree of impairment of this ability? For many years doctors and laymen have tried to answer these questions in efforts to bring about equitable decisions by such organizations as the Veterans Administration, insurance firms, the Social Security Administration, and workmen's compensation boards.

The medical profession now has a new gauge. This is a guide to the evaluation of permanent impairment of the visual system, which appears as a special article on page 475 of this issue of The Journal. It is the second such guide to be produced by the A. M. A. Committee on Medical Rating of Physical Impairment since that Committee was established by the Board of Trustees two years ago. The first, dealing with the extremities and the back, was published as a special edition of The Journal last February 15. Both guides were developed after the Committee and its outstanding consultants spent many months surveying the respective fields. Both guides will be reviewed from time to time to insure their continued value as advances in medical knowledge and techniqu occur.

While the guides should prove valuable to specialist physicians and interested nonmedical groups, they have been prepared with the general medical practitioner in mind. For it is the family doctor who is being called on increasingly to provide medical data for applications for disability benefits, and who stands to benefit greatly from uniform standards of impairment evaluation. For the past 18 years the A. M. A. has been striving to meet this need in a growing society—in 1940 adopting a recommendation of its Section on Ophthalmology on appraisal of loss of visual efficiency, in 1955 revising that pioneer report, and now bringing the information up to date in easy-to-use form.

This latest guide seeks to provide a simplified method for determining visual impairment and the extent of its effects on an individual's ability to perform the activities of daily living. Diminished visual ability is expressed as a percentage of impairment of the visual system. Diminished ability of the individual is expressed as a percentage of impairment of the "whole man." Using these values, the physician will have a practical means for expressing and calculating the extent of permanent impairment and for encouraging accurate, equitable, and uniform evaluation. Thus lay administrators should be able to pronounce proper judgment on a permanent disability. The doctor's responsibility is to evaluate a patient's impairment.

As the A. M. A. Committee continues its trailblazing work, it will present similar guides (covering the cardiovascular system, respiratory conditions, and other body systems) in future issues of The Journal. Reprints of the guide published today are available on a complimentary basis from the Committee at A. M. A. headquarters.

HYPOPHOSPHATASIA

Hypophosphatasia, a relatively rare condition, has been defined as an inborn error of metabolism characterized by abnormal mineralization of bone, diminished alkaline phosphatase activity, and increased urinary excretion of phosphorylethanolamine. One of the reasons it has been so rarely reported is that some cases have undoubtedly been thought to be rickets. Although no accurate estimate of the prevalence of the disease can be made, Fraser[1] believes it to be about one in every 100,000 live births. The disease is hereditary and close relatives even though they may show no outward signs of the disease are usually found to have a low phosphatase activity. When the condition is present at birth, failure to grow, vomiting, irritability, and constipation are commonly noted.[2] In general the later in life the disease is discovered the better the chances for recovery. There is a deficiency of calcification and as a result the growth of long bones is impaired and spontaneous fractures may occur in severe cases. Since early growth of the skull is retarded craniostenosis may develop as the child grows older. This in turn may cause convulsions and defective vision. Blindness may ensue if surgical measures are not taken to prevent it.[3] The primary teeth may be lost prematurely due to inadequate growth of alveolar bone and incomplete formation and early resorption of the roots of the teeth.

Although resembling rickets in many respects hypophosphatasia is in no way related to rickets, which is not hereditary and is not characterized by an absence of alkaline phosphatase (in rickets the phosphatase activity is normal or increased), hypercalcemia, or multiple spontaneous fractures. The histological differences are minor. In sections of rachitic bone osteoclasts are rarely seen and spicules of the substantia spongiosa are well ossified. Furthermore rickets does not affect the skull. One of the chief distinguishing features of hypophosphatasia is that vitamin D in adequate doses gives no improvement. Hypophosphatasia also usually has an earlier onset and may even occur in utero. Signs of rickets are rare in the fetus or newborn infant, occurring only when the mother had severe osteomalacia during pregnancy.[4]

Fraser grouped a series of 35 patients according to the age of the patient when the disease was discovered and concluded that if lesions are present at birth the patient will usually die within a few months. If an infant with this condition survives his first year his chances for recovery are good. In those who die renal calcinosis due to hypercalcemia is found but it is not certain that this is the principal cause of death. In patients with idiopathic hypercalcemia, however, higher levels of serum calcium are seen but are not associated with serious or permanent renal damage. If lesions appear after the child is 6 months old symptoms may gradually subside. Wide variations were observed in the rate and extent of healing. In a few patients the condition was first recognized in adult life. These patients had undue fragility of their long bone and radiologic evidence of a mild osteoporosis. In any case once healing of the bones occurred no relapses were reported but return of serum phosphatase levels to normal did not occur. Life expectancy in those with mild hypophosphatasia is probably normal. Many drugs have been used to treat this condition without success. Vitamin D should not be used because it favors hypercalcemia. Cortisone has been tried but no definite conclusions as to its value are warranted at present.

Hypophosphatasia appears to be the result of a disturbance in cellular processes concerned with either the elaboration of the organic matrix of bone or its calcification, or both. An understanding of the intrinsic disturbance in this condition should give us a better appreciation of the basic physiology of bone.

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[1] Fraser, D.: Hypophosphatasia, Am. J. Med. 22:730-746 (May) 1957.

[2] MacDonald, A. M., and Shanks, R. A.: Hypophosphatasia, Arch. Dis. Childhood 32:304-310 (Aug.) 1957.

[3] Dickson, W., and Horrocks, R. H.: Hypophosphatasia, J. Bone & Joint Surg. 40-B:64-74 (Feb.) 1958.

[4] McCance, R. A.; Fairweather, D. V. I.; Barrett, A. M.; and Morrison, A. B.: Genetic, Clinical, Biochemical, and Pathological Features of Hypophosphatasia: Based on Study of a Family, Quart. J. Med. 25:523-537 (Oct.) 1956.

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MEDICAL NEWS

ARKANSAS

New Clinical Research Wing.—The University of Arkansas Medical Center, Little Rock, has been awarded a $1,066,000 grant by the U. S. Public Health Service to help finance construction of a nine-story clinical research wing. The money will be matched dollar-for-dollar by private funds being raised within the state. The Medical Center now is composed of an eight-story hospital and a nine-story educational wing. A 10-story student dormitory and adjoining student union building are under construction. The federal grant for the research wing was one of four in excess of one million dollars in the USPHS announcement of a total of $30,000,000 awarded to medical institutions throughout the nation. The money was appropriated by Congress to expand health research facilities.

Medicine's "Festival of Faith" in Tyronza.—Sponsored by the First Councillor District of the Arkansas Medical Society, American Medicine's "Festival of Faith" will be held Oct. 2 at Tyronza, 28 miles northwest of Memphis. A medical educational symposium of students, teachers, and hospital staffs will be conducted from 11 a. m. to 12:30 p. m., moderated by Dr. Willis E. Brown, head, department of gynecology and obstetrics, University of Arkansas School of Medicine, Little Rock. A section of the symposium will be the quiz class in which seven medical school deans will be quizzed on the topic "The Why in Medicine and Medical Schools." General chairman for the afternoon session will be Dr. David B. Allman, Atlantic City, N. J., immediate past-president of the A. M. A. Speakers will include Dr. Austin Smith, editor of THE JOURNAL; Dr. George M. Fister, Ogden, Utah; Mrs. E. Arthur Underwood, Vancouver, Wash., president of the Women's Auxiliary of the A. M. A.; and Dr. Louis M. Orr, Orlando, Fla., president-elect of the A. M. A. Scientific papers will include the following:

Smoking and Its Relation to Cancer of Lung, Dr. Alton Ochsner, New Orleans, La.

The Philosophy of Human Nature As Related to Surgery, Dr. Philip Thorek, Chicago, Ill.

Pathology is the Foundation of Medicine, Dr. Mervin H. Grossman, Dallas, Texas.

One Man's Hope in Treatment of Cancer, Dr. Fred E. Woodson, Tulsa, Okla.

The Governor's Committee on Employment of the Physically Handicapped will convene at 3 p. m. For information write Dr. Lowry H. McDaniel, Chairman, Program Committee, American Medicine's Festival of Faith, Tyronza, Ark.

CALIFORNIA

Dr. Brem Appointed Chairman of Department of Medicine.—Promotion of Dr. Thomas H. Brem to be chairman of the department of medicine in the University of Southern California School of Medicine, Los Angeles, has been announced by Dr. Clayton G. Loosli, dean, following the retirement of Dr. Merritt P. Starr, head of the department from 1948 to 1955. Drs. Brem and Starr have shared the chairmanship the past three years, Dr. Brem being in charge of teaching and Dr. Starr in charge of research. Henceforth, Dr. Brem will be responsible for both fields. Until Dr. Loosli arrived July 1 from the University of Chicago to become dean, Dr. Brem also has served as chairman of the interim administrative committee of the Medical School following the resignation of Dr. Gordon Goodhart as dean in 1956. He is a member of the American Board of Internal Medicine.

Committees to Select Medical and Surgical Executives.—Two special committees have been named to select new men for the positions held by Dr. David A. Rytand and Dr. Victor Richards on the Stanford Medical School faculty, Dean Robert H. Alway has announced. Dr. Rytand has asked to be relieved of his executive duties while continuing as professor of medicine. Dr. Richards resigned as executive of the surgery department, effective Sept. 1. On the committee in search of a medical department executive are Associate Dean Lowell Rants, Drs. Alvin J. Cox Jr., Frank L. A. Gerbode, Avram S. Goldstein, Arthur Kornberg, Dwight L. Wilbur, and Albert M. Snell. On the surgery executive committee are Drs. Gerbode, William P. Creger, Roy B. Cohn, Sidney Raffel, and Henry S. Kaplan. Dr. Alway has asked both committees to report on candidates as soon as possible. The new Stanford Medical School opens on the campus Sept. 1 next year.

General Practice Meeting in San Francisco.—The California Academy of General Practice will hold its 10th scientific assembly Oct. 5-8 in the Masonic Temple, San Francisco. Dr. Ethan A. Brown, Boston, will present the Stanley R. Truman Lecture, "Reactions to Antibiotics, Especially Penicillin,"

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

and Dr. Ralph C. Benson, Portland, Ore., will give the Ivan C. Heron Lecture, "Third Trimester Obstetrical Problem." Presentations by other out-of-state speakers are:

Teenage Sex Education, Dr. Robert N. Rutherford, Seattle.
Psychotherapy in the GP's Office, Dr. C. H. Hardin Branch, Salt Lake City.
Is It Angina?, Dr. William H. Gordon, Lubbock, Texas.
Use and Abuse of Diuretics, Dr. Gordon.
"If I Had An Ulcer . . .", Dr. Philip Thorek, Chicago.

Technical exhibits and the annual informal party are planned. For information write the California Academy of General Practice, 461 Market St., San Francisco.

GEORGIA

Clinical Society Meeting.—The first annual meeting of the Grady Hospital Clinical Society, an association composed of former members of the intern and resident staff of the Grady Memorial Hospital, will be held Oct. 20 at the Grady Memorial Hospital, Atlanta. Address all inquiries to the Grady Hospital Clinical Society, Room G-610, Grady Memorial Hospital, 80 Butler St., S. E., Atlanta, Ga.

ILLINOIS

Hospital Lecture Series Opens.—The opening lecture in the ninth annual North Shore Hospital Lecture Series on "Emotional Forces in the Family" will be held at the hospital, in Winnetka, Oct. 1, 8:00 p. m. "The development of the Family in the Technical Age" will be discussed by Dr. Joost A. M. Meerloo, of The New York School of Social Research, New York City. The Commission on Education of the American Academy of General Practice has approved these lectures for category II credit. The J. B. Lippincott Company of Philadelphia will publish the entire series as a book. All royalties that accrue have been assigned to the American Psychiatric Association as in previous series. Physicians and allied professional personnel are cordially invited.

Anesthesiologists Meet in Peoria.—On Oct. 4-5 the Illinois Society of Anesthesiologists will meet at the Hotel Pere Marquette, Peoria. The scientific program will include the following:

Preparation of the Diabetic Patient for Surgery, Dr. Lucille A. Sprenger, Peoria.
Pulmonary Resection at Wisconsin General Hospital—15 Years Experience, Dr. Oswald S. Orth, Madison, Wis.
Anesthetic Management of Infants and Children Undergoing Thoracic Operations, Dr. William O. McQuiston, Peoria.

Other participants include Drs. Herbert M. Epstein, Evanston, William K. Stephan, Joliet, and Max S. Sadove, Chicago. Entertainment includes golf and a dinner, Oct. 4. For information write Mr. Clifford A. Baldwin Jr., 432 Jefferson Building, Peoria, Ill., Secretary.

Chicago

Hospital News.—The Michael Reese Hospital Medical Center has announced the appointment of Dr. Sidney Cohen, formerly associate director of laboratories, Beth Israel Hospital, Boston, to head the microbiology department of the center's Research Institute, succeeding Dr. Albert Milzer, who retired.

Tribute to Dr. Rothman.—"In tribute to the research and teaching in dermatology of Dr. Stephen Rothman," professor of medicine and head of the section on dermatology of the School of Medicine of the University of Chicago, the Society for Investigative Dermatology has dedicated the July issue of its journal to him which is limited to scientific reports by former students of Dr. Rothman. Dr. Rothman received his M.D. degree in 1917 from the University of Budapest, and has been at the University of Chicago since 1938. He is chairman of the committee on cosmetics of the American Medical Association, and of the subcommittee on the cutaneous system, of the National Research Council. He has been president of the Society for Investigative Dermatology, which elected him an honorary member in June.

Personal.—The distinguished service award gold medal of the National Medical Association, given each year "for the most distinguished service rendered to the profession on the National level," has been awarded to Dr. Leonidas H. Berry, clinical assistant professor of medicine, University of Illinois College of Medicine, "for his pioneering efforts and success in the Specialty of Diseases of the Stomach, and the 'Berry Plan' of treatment for Drug Addicts."——Martin E. E. Hanke, Ph.D., associate professor of biochemistry, University of Chicago, has been named director of the university's clinical chemistry laboratory. Among the purposes of this appointment is a consolidation of the work in clinical chemistry which is now being done independently in the various clinical departments and hospitals of the university.——Dr. Max Thorek, founder and secretary-general, International College of Surgeons, was decorated as a Commander of the Order of Merit of the Republic of Italy by Giacomo Profili, counsel general of Italy, Sept. 10.

LOUISIANA

Dr. Meleney Goes to Florida.—Dr. Henry E. Meleney, emeritus professor of preventive medicine, New York University College of Medicine, New York City, and research professor of medicine, Louisiana State University, New Orleans, will retire from his present position Sept. 30 and will become assistant health officer of Alachua County, Gainesville, Fla. His special responsibility will be the development of research and personnel training programs. He will also do teaching at the College of Medicine of the University of Florida, Gainesville.

MICHIGAN

Accidents Among School Children.—Almost half of all deaths among Michigan children of school age are caused by accidents, the Michigan Department of Health has announced. Dr. Goldie B. Corneliuson, director of maternal and child health for the state health department, said that in 1957, accidents claimed 510 lives of school-age children in Michigan, or 47% of the total deaths in that age group. Motor vehicles accounted for the major share of the accidental deaths, causing 294 fatalities, or 58% of the total accidental deaths.

MISSOURI

Lectures for Hospital's Anniversary.—A series of special lectures, sponsored by the clinical departments of Saint Louis University School of Medicine in observance of the 25th anniversary of Firmin Desloge Hospital will continue through November. The department of pediatrics will present its program Oct. 15-16, and an interdepartmental program will be held Nov. 19. Members of the medical profession are invited to attend the lectures and luncheon at Desloge free. The programs have been approved for category I credit by the American Academy of General Practice. Dr. William H. Vogt Jr. is chairman, Firmin Desloge Jubilee Committee.

NEBRASKA

Grant for Training in Rehabilitation.—Creighton University School of Medicine, Omaha, has received the first of five annual grants from the office of Vocational Rehabilitation, Washington, D. C. The grant, to be directed by Dr. Harold N. Neu, professor of medicine and coordinator of the teaching of rehabilitation, will be used "to implement personnel needed to help train medical students and residents in the modern concepts of rehabilitation." Creighton developed an organized teaching program in rehabilitation five years ago. The grant became effective Sept. 1.

NEW YORK

New Health Department in Monroe County.—Establishment of a county health department in Monroe County has been approved by Dr. Herman E. Hilleboe, state health commissioner. Monroe is the 20th county in the state to set up a health department. The new department was expected to begin operating by Sept. 1.

Society News.—At a recent meeting of the Queens Pediatric Society, the following officers were elected: president, Dr. Benjamin Goldsmith, Flushing; vice-president, Dr. Frederick Castrovinci, Jackson Heights; secretary, Dr. Emanuel Fletcher, Flushing; and treasurer, Dr. Elmer E. Amerman, Flushing. The society meets at the Seminole Club, Forest Hills, N. Y., on the second Tuesdays of October, December, February, and April at 7:00 p. m.——The Medical Society of the State of New York has announced the removal of its offices to 750 Third Ave., New York 17; phone, YUkon 6-5757.

Meeting of Physicians in Syracuse.—Dr. John H. Talbott, governor for Western New York, American College of Physicians, will open the annual meeting for that region Oct. 3 at the Syracuse Hotel, Syracuse. Twelve papers are scheduled for the two morning sessions of the one-day meeting. Dr. Howard P. Lewis, Portland, Ore., president-elect of the college, will be guest speaker at luncheon. In the afternoon a panel discussion, "The Present Status of Cardiac Surgery," will be introduced by Dr. Richard H. Lyons, of Syracuse, with Dr. Paul N. Yu, of Rochester, as chairman. A schedule of events for wives and guests is arranged. Registration fee for physicians is $10 and includes luncheon and the social hour at 4 p. m. For reservation and information write to Dr. Henry W. Retan, Syracuse Kemper Bldg., Syracuse 2, N. Y.

Personal.—Dr. Donald F. McDonald, head of the division of urology, University of Washington School of Medicine, Seattle, since 1952, has been appointed professor of urology and chairman of the division at the University of Rochester School of Medicine and Dentistry. Dr. McDonald also will be urologist-in-chief in Strong Memorial Hospital of the Medical Center. He will begin his new duties about Oct. 1 as successor to Dr. Winfield W. Scott, who will become professor of urological surgery emeritus after having served on the medical faculty for 30 years.——Dr. Paul V. Newland, formerly with the Procter & Gamble Co., has been named a staff member of The Norwich Pharmacal Company's medical department in Norwich, Dr. Paul F. MacLeod, department director, has announced.——Dr. William Nussbaum of Kew Gardens was elected to fellowship of the Royal Anthropological Institute of Great Britain and Ireland in May.

Memorial Teaching Day in Binghamton.—The third Samuel E. Cohen Memorial Teaching Day will be held Oct. 1 in the Carlton Hotel, Binghamton, with the theme, "Diagnosis and Therapeutics of Infection." The four speakers, arranged for through the cooperation of the Council Committee on Public Health and Education, Medical Society of the State of New York, and the New York State Department of Health, will present the following:

Principles in the Diagnosis of Infections, Dr. Charles M. Samet, Boston.
The Surgeon and Infection, Dr. Harold A. Zintel, New York City.
Kidney Diseases, Dr. Mitchell I. Rubin, Buffalo.

Newer Concepts in Diagnosis and Treatment of Rheumatoid Arthritis, Dr. Richard H. Freyberg, New York City.

In the evening, a round-table discussion of the afternoon presentations will be held. Postgraduate credit is given to members of the American Academy of General Practice. For information write Mr. Charles Bishara, Executive Secretary, Broome County Medical Society, 42 Front St., Binghamton, N. Y.

New York City

Dr. Thomas to Give Brown Memorial Lecture.—Dr. Lewis Thomas, chairman, department of medicine, New York University College of Medicine, New York City, will give the George Elgie Brown Memorial Lecture on "The Role of Hypersensitivity in Cardiovascular Diseases" Oct. 25 at the 31st annual meeting of the American Heart Association at San Francisco Oct. 24-26. This lecture was established in memory of Dr. George Elgie Brown formerly head of a section of medicine in the Mayo Clinic, Rochester, Minn.

Personal.—Dr. I. Newton Kugelmass, consultant to the departments of health and hospitals, New York City, addressed the department of pediatrics, University of Tokyo, Aug. 11 on the "Mechanism and Management of Hemorrhagic Disorders in Infants and Children."——Dr. Charles A. Carton has been appointed chief of the division of neurosurgery of Montefiore Hospital. He also will serve as associate clinical professor of surgery at the Albert Einstein College of Medicine.——Dr. David Grob, associate professor of medicine at Johns Hopkins University School of Medicine, Baltimore, has been appointed professor of medicine at the State University of New York Downstate Medical Center and full-time director of medical services at Maimonides Hospital of Brooklyn.——Dr. Brewster S. Miller, lecturer in neoplastic diseases at New York Medical College, has been appointed medical director of United Cerebral Palsy Associations, Inc., and research director of the United Cerebral Palsy Research and Educational Foundation, Inc.

Symposium on Diabetes.—"The Brain and Diabetes Mellitus" will be the subject of an all-day symposium sponsored by the Clinical Society of the New York Diabetes Association, to be held Oct. 10 at Hunter College Playhouse Auditorium, New York City. The program lists the following speakers:

Metabolism of the Brain and Its Relation to Diabetes Mellitus, Dr. Seymour S. Kety, Philadelphia.
Pathological Effects of Hypoglycemia, Dr. Harry M. Zimmerman, New York City.
Hypothalamic Control of the Anterior Hypophysis and Its Metabolic Implications, Dr. Roger Guillemin, Houston, Texas.
Role of the Highest Integrative Functions of the Central Nervous System in Disease, Dr. Harold G. Wolff, New York City.
Clinical Experience with Oral Hypoglycemic Agents, Dr Garfield G. Duncan, Philadelphia.
Surgery of Segmental Vascular Disease, Dr. Ernest S. Cra ford, Houston, Texas.

A panel discussion, "The Role of Environment and Personality in the Management of the Difficult Patient with Diabetes Millitus," will open the afternoon session. The symposium is sponsored by grants-in-aid from Charles Fischer and Company, Inc. Physicians, medical students, and professional personnel are invited. There is no registration fee but advanced registration is required. For information write the New York Diabetes Association, Inc., 104 E. 40th St., New York 16.

NORTH CAROLINA

Expand Duke's Allergy Training Program.—The National Institute of Allergy and Infectious Diseases, U. S. Public Health Service, has awarded Duke University Medical Center a $127,000 graduate training grant toward support of the expanded allergy program for five years. Primarily, the expansion consists of increasing the program to include research and clinical work in the allied areas of genetics, immunology, chest disease, and physiology. The work also will involve studies of the basic problems of tissue transplantation and immunological aspects of tumor research. Dr. Herbert O. Sieker, assistant professor of medicine at Duke, is director of the program. Dr. Sieker explained that the clinical allergy service at Duke Hospital is being expanded to offer diagnosis and treatment of all kinds of allergic disorders.

PENNSYLVANIA

Annual State Meeting in Philadelphia.—The Medical Society of the State of Pennsylvania will hold its 108th annual session at the Bellevue-Stratford Hotel, Philadelphia, Oct. 12-17. The general sessions will be presented as panel discussions under the following titles and moderators:

Hazards of Antibiotic Therapy, Dr. Abraham I. Braude, Pittsburgh.
Trends in Medical Care, Dr. Wendell B. Gordon, Pittsburgh.
Steroids—Uses and Abuses, Dr. Thaddeus S. Danowski, Pittsburgh.
Reduction of Mortality and Morbidity in Automobile Accidents—The Physicians' Responsibility, Dr. Constantine P. Faller, Harrisburg.
The Chronically Tired Patient—An Important Complaint, Dr. Allen W. Cowley, Harrisburg.
Special Consideration in the Care of Patients Having Malignant Disease, Dr. Charles S. Cameron, Philadelphia.

A clinicophysiologic conference, "Neonatal Crises . . . ," will be moderated by Dr. Lewis A. Barness, Philadelphia. The 11th annual state dinner will be held the evening of Oct. 14. Alumni dinners and the president's reception are arranged for Oct. 15. For information write the Medical Society of the State of Pennsylvania, 230 State St., Harrisburg, Pa.

Philadelphia

Municipal Public Health Appointments.—The Philadelphia Department of Public Health has announced the appointment of three physicians each of whom holds the degree of master of public health. Named chief of the department's Maternal and Child Health Section was Dr. Donald A. Cornely, who had been chief of medical education at Philadelphia General Hospital. Dr. Harriett C. Jones was appointed to the District Health Operations unit, which has the responsibility for program planning and execution in the city's 10 health districts and health centers. Dr. Thomas W. Georges Jr., will be assistant director of the health program in Philadelphia's Health District 1. Dr. James P. Dixon, health commissioner, said that additional positions are available including those of director of the Disease Control Division, chief of the Tuberculosis Control Section, and directors of health district programs.

TENNESSEE

Mental Hospital for Medical Center.—The Medical Center in Memphis, in which the University of Tennessee shares prominently, is soon to have a state hospital for the mentally ill. The master plan for a six-million-dollar mental health center will use the entire block across from LeBonheur Hospital. The land is now being cleared and by October work will start on the 3¼-million-dollar 200-bed hospital. Training and research faculties now handled in present university facilities and Gailor Psychiatric hospital will be transferred to the mental health center as the buildings are completed. The fields of training will include psychiatric residents, clinical psychology, social work, nursing psychiatry, and occupational and recreational therapy.

TEXAS

Dr. DeBakey Awarded Alvarenga Prize.—On July 14 the College of Physicians of Philadelphia awarded the Alvarenga Prize for 1958 to Dr. Michael E. DeBakey, professor of surgery, Baylor University College of Medicine, Houston, "for his outstanding work in the surgical treatment of diseases of blood vessels." The Alvarenga Prize was established by the will of Pedro Francisco DaCosta Alvarenga, of Lisbon, Portugal, an associate fellow of the College of Physicians of Philadelphia, to be awarded annually by the college on the anniversary of the death of the testator, July 14, 1883.

Annual Award for Research in Psoriasis.—The department of dermatology, Baylor University College of Medicine, Houston, has announced an International Memorial Award for Psoriasis Research, established as a 10-year program by Carol and Henry J. N. Taub in honor of their grandparents. An annual award of $1,000 for research on psoriasis, it is designated "for the individual or group who has done the most out-standing investigative work in this field." Results of the research must have been presented before a dermatological medical society or published in a recognized medical journal. The name of any applicant for the award, together with supporting data, should be submitted for consideration by Dec. 1. The recipient will be determined by a committee composed of Drs. Marcus R. Caro, Edward P. Cawley, Arthur C. Curtin, Eugene M. Farber, John M. Knox, Aaron B. Lerner, and Carl T. Nelson. Address all communications to Dr. John M. Knox, Department of Dermatology, Baylor University College of Medicine, Houston 25, Texas.

VERMONT

Dr. Bland to Study in England.—Dr. John H. Bland, associate professor of medicine, University of Vermont College of Medicine, and director of the Arthritis Clinics at the Mary Fletcher and DeGoesbriand Memorial hospitals, in Burlington, has left on a one-year leave of absence for Manchester, England, where he will be associated with Prof. Jonas H. Kellgren, director of the Rheumatism Research Center at the University of Manchester, where each year scientists are invited to work and study. Dr. Bland, one of two M.D.'s invited this year, will work in the area of connective tissue biochemistry. He plans to visit several European universities to discuss connective tissue investigation and plans to make a comparative study of medical education methods in England, Europe, and the United States. Dr. Bland's leave is under the auspices of the Nuffield Foundation in England, the Commonwealth Fund of New York, the New England Chapter of the Arthritis and Rheumatism Foundation, and the National Institutes of Health. During Dr. Bland's leave, the two active clinics of the DeGoesbriand Memorial and Mary Fletcher Hospitals will be under the direction of Dr. Winston M. Eddy, of Burlington.

WISCONSIN

Dr. Engstrom Appointed Department Chairman.—Dr. William W. Engstrom, associate professor of medicine, Marquette University School of Medicine, Milwaukee, has been named the Francis D. Murphy professor and chairman of the department of medicine, effective Aug. 15. Dr. Engstrom assumes the post held by Dr. Francis D. Murphy, who will remain a professor in the department and active in the teaching program of the medical school. Dr. Engstrom has also been appointed director of medicine of Milwaukee County Hospital, a post held by Dr. Murphy for 33 years.

GENERAL

Congress on Safety in Chicago.—The 46th National Safety Congress and Exposition will be held Oct. 20-24, with activities at the Conrad Hilton, Sheraton-Blackstone, Pick-Congress, Hamilton, La Salle, and Morrison Hotels, Chicago. The 13th annual Federal Safety Conference, sponsored by the Federal Safety Council, will be held Oct. 20-21. Over 45 section meetings will be held for discussion of safety in industry, farming, mining, transportation, and commerce. A program of safety films and exhibits is arranged. The American Society of Safety Engineers will meet Oct. 21, with an annual chapter achievement awards luncheon at 12:15 p. m. Entertainment for the congress includes the banquet Oct. 22, 6:30 p. m., at the Conrad Hilton Hotel. Registration fee is $5. For information write the National Safety Council, 425 N. Michigan Ave., Chicago.

Meeting on Surgery of Trauma.—The American Association for the Surgery of Trauma will hold its 18th annual session Oct. 2-4 at the Drake Hotel, Chicago. The presidential address will be given the afternoon of Oct. 3 by Dr. William L. Estes Jr., Bethlehem, Pa. Over 40 papers are scheduled for presentation including the following by Canadian authors: "Traumatic Diplopia," Dr. Arthur L. Murphy, Halifax, Nova Scotia, and "First Aid Equipment for Traffic Accidents," Dr. John C. Dickison, Montreal. A symposium on "The Impartial Medical Testimony Plan" will be moderated by Dr. William E. Mishler, Cleveland. Dr. Percival Bailey, professor of neurology and neurological surgery, University of Illinois College of Medicine, Chicago, will present "The Seat of the Soul" at the banquet, 8 p. m., Oct. 3. For information write Dr. James K. Stack, 700 N. Michigan Ave., Chicago 11.

Annual Meeting on Clinical Orthopedics.—The 46th annual meeting of the Clinical Orthopaedic Society will be held Oct. 2-4 in Denver and Colorado Springs, under the presidency of Dr. Marcus J. Stewart, Memphis, with headquarters at the Brown Palace Hotel, Denver. The program includes over 40 clinical presentations and the following Denver speakers will present three papers each: Dr. Murray E. Gibbens, Dr. John T. Jacobs Jr., Dr. Mack L. Clayton, and Dr. James S. Miles. Discussion periods will follow each speaker's presentations. Presiding at the clinical sessions will be Drs. Rufus H. Alldredge, New Orleans; Rudolph S. Reich, Cleveland; Gordon C. Whiston, Casper, Wyo.; Charles R. Rountree, Oklahoma City; Clinton L. Compere, Chicago; and Frank O. McGehee, Houston, Texas. Entertainment includes golf, swimming, riding, ice skating, and the annual banquet Oct. 3, 6:30 p. m. For information write Dr. Charles H. Frantz, 1810 Wealthy St., S. E., Grand Rapids, Mich.

Roentgen Ray Society Meeting in Washington, D. C.—The American Roentgen Ray Society will hold its 59th annual meeting Sept. 30-Oct. 3 at the Shoreham Hotel, Washington, D. C. The Caldwell Lecture will be delivered the evening of Sept. 30 by Dr. Leo G. Rigler, president, Radiological Society of North America, on "Functional Roentgen Diagnosis—Anatomical Image—Physiological Interpretation." Of the 39 scheduled papers, the following are by Canadian authors:

Roentgenological Features of Meningeal Fibroblastoma, Dr. Sidney P. Traub, Saskatoon, Saskatchewan.

Tomography in the Radiological Evaluation and Differentiation of Chronic Hypertrophic Emphysema and Asthma, Drs. Robert G. Fraser and David V. Bates, Montreal, Quebec.

Investigation of Effects of Opaque Media on the Lungs with Comparison of Barium Sulphate, Lipiodol and Dionosil, Drs. G. Bernard Skinner, George I. Wortzman, James R. Stuart, and John S. Dunbar, Montreal.

A golf tournament and golf dinner are planned for Sept. 28. President-elect Dr. Barton R. Young is chairman of the committee on arrangements for the scientific program.

Southeastern Physicians Meeting in Biloxi.—The American College of Physicians will hold a southeastern regional meeting (Alabama, Florida, Georgia, South Carolina, and Cuba) Oct. 3-4 at the Buena Vista Hotel, Biloxi, Miss. Of the twenty papers scheduled, the following include guest authors:

Clinical and Physico-Chemical Studies on Macroglobulinemia, Dr. William J. Hammack and Willard R. Starnes, M.S., Birmingham.

Nitroglycerin by Inunction in the Treatment of Angina Pectoris, Dr. James A. Davis, Birmingham.

Preliminary Report on Retrograde Catheterization of the Left Ventricle, Drs. Francisco A. Hernandez, H. R. Cooper, and Herbert Eichert, Miami, Fla.

Myelofibrosis, Drs. Charles C. Corley Jr. and Charles M. Huguley Jr., Atlanta, Ga.

Peripheral Neuropathy in Myxedema, Drs. Lamar E. Crevasse and Robert B. Logue, Atlanta, Ga.

Coronary Disease in the Negroes of Haiti and the United States, Drs. Dale Groom, Edward E. McKee, Charles Webb, B.S., and Faye W. Grant, Ph.D., Charleston, S.C., and Dr. Vergniaud Pean, Port-au-Prince.

At the dinner session Oct. 3, Dr. Dwight L. Wilbur, San Francisco, president, American College of Physicians, will present an address. For information write Dr. Duward O. Wright, 2930 N. 16th St., Birmingham 2, Ala., Governor for Alabama.

Annual Meeting of Pediatricians.—The 27th annual meeting of the American Academy of Pediatrics will be held Oct. 18-23 at the Palmer House, Chicago. Two-day seminars will be held Oct. 18-19, and half-day round-tables will run concurrently with the general sessions. The Borden award presentation will be given Oct. 20 by Dr. Charles D. May, New York City, on "Protein Allowance in Infant Nutrition." Five symposiums are planned, with the following titles and chairmen:

Regulation of Carbohydrate Metabolism, Dr. Rachmiel Levine, Chicago.

Radioactive Isotopes in Pediatric Medicine, Dr. Lee E. Farr, Upton, N. Y.

Cystic Fibrosis of the Pancreas, Dr. May.

Office Evaluation of Intelligence and the Special Senses, Dr. Harry Bakwin, New York City.

Recent Developments in Control of Infectious Diseases, Dr. Edward C. Curnen Jr., Chapel Hill, N. C.

A panel discussion on "The Pediatrician's Responsibility in Mental Health Counseling" is planned for Oct. 21, with Dr. Sherman Little, Buffalo, N. Y., as chairman. A banquet, a program of ladies' entertainment, and alumni meetings are arranged. For information write Dr. Einor H. Christopherson, P. O. Box No. 1116, Evanston, Ill., Executive Secretary.

Plastic Surgeons Meeting in Chicago.—The 27th annual meeting of the American Society of Plastic and Reconstructive Surgery will be held Oct. 12-17, with headquarters at the Drake Hotel, Chicago. Foreign participants will include Drs. Fernando Ortiz-Monasterio and R. Serrano, Mexico City, who will present "Cephalometric Measurements on Adult Patients with Nonoperated Cleft Palates," and Drs. Hamilton A. Baxter and Marcy A. Goldstein, Montreal, Canada, who will give "Duration of Survival of Human Fetal Grafts." The program includes four symposiums and the following papers with invited guest authors:

Place of Radiation Therapy in Treatment of Advanced Carcinoma of Lower Lip, Dr. Isadore Lampe, Ann Arbor, Mich.

Vascular Reinforcement of Pedicled Tissues Using Histamine Iontophoresis, Drs. Richard B. Stark and Clayton R. De Haan, New York City.

Homotransplantation of Thyroid and Parathyroid Glands by Vascular Anastomoses, Drs. Herbert Conway and James W. Smith, New York City.

Skin Grafting Procedures in Injuries of the Hand, Dr. Joseph L. Posch, Detroit.

Reconstruction of the Penis, Drs. Jerome Gelb, Maxwell Malament, and Stephen R. Loverne, Newark, N. J.

Exhibits are planned, and entertainment includes the society dinner Oct. 13, 7 p. m., and the president's banquet, Oct. 16, 6 p. m., at which Mr. Ralph G. Newman will talk on Abraham Lincoln and Dr. Wallace H. Steffensen, president of the society, will speak. For information write Dr. Kenneth L. Pickrell, Duke Hospital, Durham, N. C.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

	Aug. 30, 1958		Aug. 31, 1957
Area	Paralytic Type	Total Cases	Total
New England States			
Maine	..	..	..
New Hampshire	..	..	1
Vermont	..	..	1
Massachusetts	..	4	..
Rhode Island	..	..	..
Connecticut	..	2	6
Middle Atlantic States			
New York	4	13	19
New Jersey	10	23	8
Pennsylvania	3	4	4
East North Central States			
Ohio	8	22	16
Indiana	5	18	6
Illinois	5	15	31
Michigan	25	68	47
Wisconsin	..	6	20
West North Central States			
Minnesota	2	2	1
Iowa	2	2	2
Missouri	7	16	8
North Dakota	1	1	3
South Dakota	..	..	2
Nebraska	..	1	3
Kansas	..	..	1
South Atlantic States			
Delaware	..	..	..
Maryland	..	1	..
District of Columbia	..	..	6
Virginia	5	6	3
West Virginia	10	13	2
North Carolina	1	2	6
South Carolina	..	..	1
Georgia	2	3	2
Florida	4	5	1
East South Central States			
Kentucky	1	1	7
Tennessee	1	5	8
Alabama	1	1	..
Mississippi	1	1	1
West South Central States			
Arkansas	..	..	..
Louisiana	4	5	12
Oklahoma	..	..	2
Texas	17	28	16
Mountain States			
Montana	..	..	2
Idaho	..	..	..
Wyoming	..	..	..
Colorado	..	..	1
New Mexico	..	..	1
Arizona	1	3	1
Utah	..	..	1
Nevada	..	..	..
Pacific States			
Washington	..	..	..
Oregon	3	5	..
California	3	4	20
Territories and Possessions			
Alaska	..	..	..
Hawaii	1	1	..
Puerto Rico	2	2	..
Total	129	253	272

CANADA

Seminar on Blood Banking in Montreal.—A two-day Seminar in Blood Banking and Immunohematology will be held at The Royal Victoria Hospital, Montreal, Quebec, Oct. 16-17. The seminar is designed to demonstrate the newest techniques. The program will be the same on both days. There is no registration fee. Medical personnel interested in attending should communicate with the Post-Graduate Board, Montreal, Royal Victoria Hospital, soon, indicating their choice of dates.

EXAMINATIONS AND LICENSURE

MEDICAL SPECIALTY BOARDS

American Board of Anesthesiology: *Oral Examination.* San Francisco, Sept. 29-Oct. 3, and Phoenix, April 5-10, 1959. The 1959 written examination will be given in various locations in the United States and Canada, July 17. The final date for filing application for the 1959 written examination is six months prior to the examination. There is no filing deadline for oral examinations. Sec., Dr. Curtiss B. Hickcox, 217 Farmington Ave., Hartford 8, Conn.

American Board of Dermatology: *Written. Several Cities,* June 30. *Oral.* Detroit, Oct. 17-19. Final date for filing all applications is April 1. Sec., Dr. Beatrice Maher Kesten, One Haven Ave., New York 32.

American Board of Internal Medicine: *Written.* Oct. 20, 1958. *Oral.* Chicago, Oct. 13-16. *1959 Schedule—Written,* Oct. 19. Final date for filing application is May 1. *Oral.* For candidates in the South and Southwest, New Orleans, Feb. 3-6. Final date for filing application is Jan. 1. *Oral.* For candidates in the Midwest. Chicago, April 15-18. Final date for filing application is Jan. 1. *Oral.* For candidates on the West Coast. Final date for filing application is March 1. *Oral.* For candidates on the East Coast, Nov. 6-7, 9-10. Final date for filing application is March 1. *Examination in the Subspecialties. Gastroenterology.* Philadelphia, April 17-18. Final date for filing application is Feb. 1. Sec.-Treas., Dr. William A. Werrell, One West Main St., Madison 3, Wis.

American Board of Neurological Surgery: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

American Board of Obstetrics and Gynecology: Applications for certification, new and reopened, Part I, and requests for re-examination Part II, are now being accepted. All candidates are urged to make such application at the earliest possible date. Deadline date for receipt of application is September 1, 1958. No application can be accepted *after* that date. It should be noted by prospective candidates that the deadline date in 1959 is August 1. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

American Board of Ophthalmology: *Written,* qualifying test (Part I), January 1959. Final date for filing application was July 1, 1958. *Oral Examinations 1958* (Part II): Chicago, Oct. 6-10. Sec., Dr. Merrill J. King, Box 238, Cape Cottage Branch, Portland, Maine.

American Board of Orthopaedic Surgery: *Part II.* Chicago, Jan. 21-23, 1959. Deadline for receipt of applications was Aug. 15. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

American Board of Otolaryngology: *Oral.* Chicago, Oct. 6-10. Final date for filing application was April 30. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

American Board of Pathology: Chicago, Oct. 30-Nov. 1. Final date for filing application is Sept. 30. Sec., Dr. Edward B. Smith, Indiana University Medical Center, 1100 W. Michigan St., Indianapolis 7.

American Board of Pediatrics: *Oral.* Chicago, Oct. 24-26 and New York, Dec. 5-7. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

American Board of Plastic Surgery: *Oral and Written.* Chicago, Oct. 9-11. Final date for receipt of case reports was July 1. Corresponding Secretary, Mrs. Estelle E. Hillerich, 4647 Pershing Ave., St. Louis 8.

American Board of Preventive Medicine: *Examination in Public Health.* St. Louis, Oct. 24-26. Final date for filing application was Aug. 15. Sec., Dr. Thomas F. Whayne, 3438 Walnut St., Philadelphia 4.

American Board of Psychiatry and Neurology: New York City, Dec. 15-16; New Orleans, Mar. 16-17. Training credit for full time psychiatric and/or neurologic assignment in unapproved military programs or services between the dates of Jan. 1, 1950 and Jan. 1, 1954 will be terminated on Jan. 1, 1959. Sec., Dr. David A. Boyd, 102-110 Second Ave. S. W., Rochester, Minn.

American Board of Radiology: *Regular Examination.* Washington, D. C., Dec. 8-11. Final date for filing application was July 1. *Special examination in Nuclear Medicine for those diplomates in Radiology or Therapeutic Radiology.* Washington, D. C., Dec. 6. Final date for filing application is Oct. 1. *Special Examination.* Cincinnati, Mar. 16-19, 1959. Final date for filing application is Nov. 1. Candidates completing training June 30, 1959 are not eligible for the Spring 1959 examinations. Sec., Dr. H. Dabney Kerr, Kahler Hotel Bldg., Rochester, Minn.

American Board of Surgery: Written examinations (Part I) will be held at various centers in the United States, Canada, Hawaii, Puerto Rico, and certain military centers abroad on December 3. The date of the Fall examination in *Part I* has been changed from the last Wednesday of October as announced in its current Booklet of Information to December 3, 1958. Thereafter, examinations in Part I will be held once annually, on the first Wednesday of December. The closing date for filing applications will be August 1. *Part II.* Rochester, Minn., Oct. 20-21; Nashville, Tenn., Nov. 17-18; New York City, Dec. 15-16; Houston, Tex., Jan. 12-13; New Haven, Conn., Feb. 9-10; Durham, No. Car., March 9-10; San Francisco, April 13-14; Indianapolis, May 11-12; Columbus, Ohio, May 14-15. Sec., Dr. John B. Flick, 1617 Pennsylvania Blvd., Philadelphia 3.

Board of Thoracic Surgery: Various centers throughout the United States. *Written.* Spring of 1959. Final date for filing application is December 1. Sec., Dr. Wm. M. Tuttle, 1151 Taylor Avenue, Detroit 2.

American Board of Urology: *Written Examination.* Twenty-five cities throughout the country, Dec. 5. The oral will be given in Chicago in February 1959. Sec., Dr. William Niles Wishard, Jr., 30 Westwood Road, Minneapolis 26.

GOVERNMENT SERVICES

AIR FORCE

Medical Symposium in Japan.—The Eighth Medical Symposium to be held at Yamato Air Station in Japan, Oct. 5-8, is expected to be attended by 250 civilian and military physicians from the United States and several foreign countries. The hosts will be the Fifth Air Force and the U. S. Air Force Hospital at Tachikawa. A group from the Air Force Missile Test Center at Patrick Air Force Base, Fla., will present lectures dealing with current development in missile and space vehicle technology. The Wright Air Development Laboratory will present papers on human factors in space flight. The Aero Medical Laboratory will demonstrate some of the latest equipment. Two national consultants to the Air Force will be among the speakers. Invitations to the symposium have been sent to civilian and military personnel in Nationalist China, Cambodia, Korea, Vietnam, Thailand, the Philippines, Burma, Pakistan, Singapore, India, the United Kingdom, Australia, Japan, and Hong Kong. Major Gen. O. K. Niess, PACAF command surgeon, in announcing plans for the symposium stated that one of the chief objectives was to promote cooperation among scientists concerned with aeronautical and medical development and to stimulate medical research among physicians of the United States Air Force and the Asian nations.

VETERANS ADMINISTRATION

Personal.—Dr. Turner Camp, chief medical officer of the Veterans Administration outpatient clinic in Los Angeles, has been named director of clinics in the VA Department of Medicine and Surgery in Washington, D.C., succeeding Dr. Arthur J. Klippen. Dr. Klippen was appointed director of hospitals in the department in Washington, to fill a position that has been vacant for some time.

PUBLIC HEALTH SERVICE

New Program Called COSTEP.—Assignments under the Commissioned Officer Student Training and Extern Program, which is known as COSTEP, are open each year to medical, dental, engineering, science, nursing, and veterinary students who complete their second or third year of professional education on or before July 1 and who are interested in becoming Reserve Officers in the Public Health Service's Commissioned Corps. Students selected are offered commissions in grades equivalent to those held by officers in the armed forces, and they are placed on active duty not to exceed 120 days. Opportunities for either medical or dental internships or active duty on graduation are also available to qualified students.

One hundred thirty-five students from 120 approved four-year professional schools have spent the present summer in U. S. Public Health Service facilities under the PHS year-round training program. While the largest number of students under COSTEP are employed by the PHS during the summer months, the program is open the year-round so that students attending schools operating on the quarter system can apply throughout the year. Its purpose is fourfold: (1) to stimulate the interest of promising students in careers in the Public Health Service, principal health agency of the federal government; (2) to enable students to further their professional knowledge while gainfully employed; (3) to give students an opportunity to increase their understanding in the functions of government and independent public health agencies; and (4) to provide the PHS with competent help during the vacation months.

The assignments under COSTEP, in general, are (1) laboratory assignments in medical research programs at the National Institutes of Health, Bethesda, Md., and the Communicable Disease Center, Atlanta, Ga., (2) clinical clerkships at Public Health Service hospitals and other medical facilities in the United States and Alaska (usually open to students with three years of professional education), and (3) field assignments in public health activities in a number of places throughout the United States.

MISCELLANEOUS

Applications for National Science Foundation Fellowships Due October 15.—The deadline for applications for National Science Foundation Senior Postdoctoral and Science Faculty Fellowships is Oct. 15, 1958. Announcement of awards will be made on Dec. 5, 1958, by the foundation. Awards will be made in medical and biological sciences including anthropology and psychology (excluding clinical); the mathematical, physical, and engineering sciences; and in selected social science fields. Included as well are interdisciplinary fields which overlap two or more scientific disciplines.

Candidates for Senior Postdoctoral Fellowships must be United States citizens who have held the doctoral degree for a minimum of five years or have equivalent education and experience. The Science Faculty Fellowships are directed toward college teachers of science who wish to improve their competence as teachers. These fellowships are open to application by any United States citizen who holds a baccalaureate degree or its equivalent, has demonstrated ability and special aptitude for science teaching and advanced training, and has taught at the collegiate level for a minimum of three years and intends to continue teaching. Application materials may be obtained from the Division of Scientific Personnel and Education, National Science Foundation, Washington 25, D. C.

DEATHS

Abbissinio, Joseph J. Ⓜ Chicago; Regia Universita degli Studi di Roma, Facolta di Medicina e Chirurgia, Italy, 1937; on the staff of St. Francis Hospital in Blue Island, where he died Aug. 8, aged 48, of coronary thrombosis.

Adler, Ludwig Ⓜ New York City; Medizinische Fakultät der Universität, Vienna, Austria, 1901; associated with the Beth Israel and St. Clare's hospitals; died in New Milford, Conn., Aug. 8, aged 82.

Affhauser, Robert Maurice Ⓜ Chicago; Loyola University School of Medicine, Chicago, 1922; veteran of World War II; member of the city board of health; on the staff of the Englewood Hospital; died Aug. 11, aged 62, of coronary occlusion and arteriosclerosis.

Alexander, Robert Mackey, Reading, Pa.; Jefferson Medical College of Philadelphia, 1910; an associate member of the American Medical Association; past-president of the Berks County Medical Society; specialist certified by the American Board of Internal Medicine; veteran of World War I; visiting physician at the Berks County Tuberculosis Sanatorium; consultant in medicine at the Reading Hospital, where he died Aug. 4, aged 74, of cancer of the ampulla of vater.

Baker, Waldo Zimmerly, Youngstown, Ohio; Ohio State University College of Homeopathic Medicine, Columbus, 1918; member of the Ohio State Medical Association; county jail physician; associated with Youngstown and St. Elizabeth's hospitals; died in St. Mary's Hospital, Rochester, Minn., Aug. 5, aged 67, of cancer of the lung.

Bliss, Howard Clifford, Vestaburg, Pa.; University of Pittsburgh School of Medicine, 1909; past-president of the Rotary Club of Fredericktown; on the courtesy staff of the Brownsville (Pa.) Hospital; died in Uniontown, Pa., July 28, aged 75, of cerebral thrombosis and cerebral arteriosclerosis.

Brager, Louis R., Forest Hills, N. Y.; Long Island College Hospital, Brooklyn, 1912; died in the Park East Hospital, New York City, Aug. 3, aged 72, of myocardial infarction.

Brennan, Alfred Theodore Vincent Jr., Tenafly, N. J.; Columbia University College of Physicians and Surgeons, New York City, 1930; consultant in the department of dermatology at the Holy Name Hospital in Teaneck and for many years associated with the Englewood (N. J.) Hospital, where he died July 31, aged 53, of carcinoma of the tongue.

Brown, Andrew Dobbie Ⓜ Central City, Neb.; University of Nebraska College of Medicine, Omaha, 1912; died July 30, aged 72.

Brown, Rolla Oscar Ⓜ Kailua, Hawaii; born in Pittsburgh May 7, 1895; University of Pennsylvania School of Medicine, Philadelphia, 1920; specialist certified by the American Board of Urology; member of the American Urological Association; fellow of the American College of Surgeons; fellow in surgery at the Mayo Foundation in Rochester, Minn., from 1922 to 1924; served as a consultant in urology to the Leahi Home and a member of the urologic service of Queen's Hospital in Honolulu, formerly chairman of the Hawaiian Territorial Medical Examiners and secretary of the Hawaii Territorial Medical Association; died at the Good Samaritan Hospital in Los Angeles July 24, aged 63, of cancer of the lung.

Cervone, Louisa Santoro, Youngstown, Ohio; University of Wooster Medical Department, Cleveland, 1900; died in the Woodside Receiving Hospital July 31, aged 80, of arteriosclerosis.

Christensen, Walter Ⓜ North Hollywood, Calif.; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1904; died July 21, aged 79, of cerebral thrombosis.

Conrad, Robert Waite Ⓜ St. Joseph, Mo.; George Washington University School of Medicine, Washington, 1943; certified by the National Board of Medical Examiners; veteran of World War II and was decorated for bravery; on the staff of the Missouri Methodist Hospital; died in St. Joseph's Hospital July 27, aged 40, of acute hemorrhagic pancreatitis.

Cook, Elbert Clancy, Bradenton, Fla.; Kentucky School of Medicine, Louisville, 1906; member of the Florida Medical Association; died June 5, aged 80, of a heart attack.

Corbin, Robert Adwood, Hammond, La.; Tulane University School of Medicine, New Orleans, 1914; specialist certified by the American Board of Otolaryngology; veteran of World War I; formerly on the staff of the Touro Infirmary in New Orleans; died in Fort Walton Beach, Fla., July 21, aged 66.

Critchfield, Otis D., West Unity, Ohio; the Hahnemann Medical College and Hospital, Chicago, 1910; veteran of World War I; died in Stryker May 25, aged 75.

Ⓜ Indicates Member of the American Medical Association.

Curry, Dalferes Pennington Ⓜ Columbia, S. C.; Kentucky University Medical Department, Louisville, 1903; member of the Medical Association of the Isthmian Canal Zone, of which he was formerly vice-president; served as assistant chief health officer of the Panama Canal Zone; died in the Columbia Hospital July 23, aged 79, of bronchopneumonia and coronary thrombosis.

Danforth, James Chester Ⓜ Grosse Pointe Woods, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1915; on the staffs of the Holy Cross, Grace, and Evangelical Deaconess hospitals in Detroit; died in the Cottage Hospital July 31, aged 70, of cerebral thrombosis.

Dickinson, Almer Edwin, Los Gatos, Calif.; the Hahnemann Medical College and Hospital, Chicago, 1897; died May 20, aged 85.

Dodd, John Edward Ⓜ Framingham, Mass.; Tufts College Medical School, Boston, 1910; fellow of the American College of Surgeons; a member of the board of health for many years; on the staff of the Framingham Union Hospital; died July 25, aged 71, of pulmonary embolism.

Fessman, John William Ⓜ Runnemede, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1928; veteran of World War II; a director of the Runnemede branch of the Camden Trust Company; chairman of the board of the Camden County Hospital for Chest Diseases, Lakeland; associated with the West Jersey Hospital in Camden, where he died July 28, aged 54, of acute coronary occlusion.

Fett, Bennie John Ⓜ Port Arthur, Texas; University of Tennessee College of Medicine, Memphis, 1932; member and past-president of the staff of St. Mary's Hospital, where he died July 31, aged 50, of acute monocytic leukemia.

Fillmore, Hartson Dustin, Wichita Falls, Texas; University of Tennessee Medical Department, Nashville, 1901; veteran of World War I and the Spanish-American War; died July 30, aged 84, of carcinoma of the lung.

Fisch, Benjamin Ⓜ Brooklyn; Deutsche Universität Medizinische Fakultät, Prague, Czechoslovakia, 1924; died in the Maimonides Hospital July 20, aged 61, of a cerebral vascular accident and arteriosclerosis.

Flower, Morris Aaron Ⓜ Newark, N. J.; Medico-Chirurgical College of Philadelphia, 1911; member of the American Academy of General Practice; on the courtesy staff of Beth Israel Hospital, where he died Aug. 1, aged 71, of cerebral hemorrhage and arteriosclerosis.

Forkin, William Patrick, Chilton, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; at one time on the staff of the Jacksonville (Ill.) State Hospital; died in the Alexian Brothers Home in Oshkosh July 28, aged 82, of bronchopneumonia chronic purulent bronchitis, and bronchiectasis.

Gibbens, Howard Clinton, Salem, N. J.; Medico-Chirurgical College of Philadelphia, 1903; for many years medical missionary in Burma; died in the Salem County Memorial Hospital July 20, aged 86.

Glassberg, Irving Jeffery Ⓜ Minneapolis; University of Minnesota Medical School, Minneapolis, 1935; specialist certified by the American Board of Urology; member of the American Urological Association; fellow of the American College of Surgeons; at one time on the faculty of Louisiana State University School of Medicine in New Orleans, where he was on staff of the Touro Infirmary; on the faculty of his alma mater; veteran of World War II; died in Mount Sinai Hospital July 28, aged 51.

Gordon, Edward Johnston, Newburgh, N. Y.; Bellevue Hospital Medical College, New York City, 1898; veteran of World War I; served as rating specialist at the Veterans Administration Hospital in Lyons, N. J., and Newark, N. J.; died July 25, aged 83, of arteriosclerotic heart disease and pulmonary emphysema.

Graham, William Alex, Powell, Wyo.; Keokuk (Ia.) Medical College, 1898; died in the War Memorial Hospital June 26, aged 87, of arteriosclerosis.

Halabi, Nour Eddine Ⓜ Bellefonte, Del.; American University of Beirut School of Medicine, Lebanon, 1947; interned at the Alexandria Hospital in Alexandria, Va., where he served a residency; formerly a resident at the Delaware Hospital in Wilmington. Wilmington (Del.) General Hospital, and the Temple University Hospital in Philadelphia; for two years served in the U. S. Army Reserve; died July 24, aged 35.

Haley, Marcus Delafayette Ⓜ Stearns, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1926; on the staff of the Somerset City (Ky.) Hospital; died in St. Joseph's Hospital, Lexington, July 25, aged 63, of cancer of the lung.

Hall, Huger Tudor Ⓜ Aiken, S. C.; Medical College of South Carolina, Charleston, 1934; vice-chief of staff, Aiken County Hospital, where he died July 25, aged 50, of bronchogenic cancer.

Hayward, Eugene Henderson, Baltimore; Baltimore Medical College, 1901; fellow of the American College of Surgeons; an associate member of the American Medical Association; past-president of the Baltimore City Medical Society; veteran of

World War I; associated with Mercy, University, Church Home, Bon Secours, St. Agnes, Maryland General, Provident, and Union Memorial hospitals, and St. Joseph's Hospital, where he died Aug. 5, aged 80, of congestive heart disease and aneurysm of the abdominal aorta.

Heath, Louanna, Maplewood, N. J.; Woman's Medical College of Pennsylvania, Philadelphia, 1903; died in Vineyard Haven, Mass., Aug. 5, aged 78, of acute myocardial infarct.

Hicks, Harvard Raymond, Doylestown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1923; veteran of World War II; served as medical director of the Neshaminy Manor Home; affiliated with Presbyterian Hospital in Philadelphia, Abington (Pa.) Memorial Hospital, and the Doylestown Hospital, where he died July 29, aged 61, of coronary sclerosis and peripheral vascular disease.

Holton, Thomas Jefferson, Charlotte, N. C.; Atlanta School of Medicine, 1909; died in Columbia, S. C., July 26, aged 77.

House, Lewis Clinton, El Centro, Calif.; University of Colorado School of Medicine, Denver, 1914; served as president of the Imperial County Medical Society; for many years county health officer; fellow of the American College of Surgeons; on the staff of the Imperial County Hospital; a director of the El Centro Branch, Bank of America; died July 29, aged 75, of terminal pneumonia and uremia.

Hyder, Herman Pettibone Ⓜ Bentonville, Ohio; University of Arkansas School of Medicine, Little Rock, 1917; died July 23, aged 73.

Joyce, Reid Petree Ⓜ Xenia, Ohio; University of Pennsylvania School of Medicine, Philadelphia, 1932; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; associated with the Greene Memorial Hospital, where he died July 16, aged 50, of coronary thrombosis.

Killoran, Vincent Ambrose Ⓜ Fort Lauderdale, Fla.; University of Toronto Faculty of Medicine, Toronto, Ontario, Canada, 1927; died in Hawaii July 26, aged 58.

Kline, Ralph Glenn Ⓜ Hoopeston, Ill.; University of Illinois College of Medicine, Chicago, 1916; served on the faculty of his alma mater; a surgeon for the Chicago and Eastern Illinois Railroad; died in the Lakeview Hospital, Danville, July 28, aged 70.

Long, Samuel Clark, Philadelphia; Medico-Chirurgical College of Philadelphia, 1912; an associate member of the American Medical Association; for many years medical director of the Atlantic Refining Company; on the staffs of the St. Agnes and Methodist hospitals; died Aug. 3, aged 73, of cerebral thrombosis and arteriosclerosis.

Lusk, Hamilton Neal Ⓜ Temple, Texas; Baylor University College of Medicine, Dallas, 1905; served as mayor; died in the Scott and White Hospital July 30, aged 81, of leukemia.

Mathis, William Harris, North Augusta, S. C.; University of Georgia Medical Department, Augusta, 1917; veteran of World War I; died in Augusta, Ga., July 28, aged 68.

McCord, Arthur Nelson Ⓜ Streator, Ill.; Chicago College of Medicine and Surgery, 1908; also a pharmacist; veteran of the Spanish-American and World War I; on the staff of St. Mary's Hospital; died July 24, aged 88, of rheumatoid arthritis.

Mellin, L. Robert Ⓜ Chicago; Bennett Medical College, Chicago, 1914; served as a member of the board of education; veteran of World War I; associated with Alexian and Columbus Memorial hospitals; died in the Albert Merritt Billings Hospital Aug. 6, aged 65, of bronchogenic carcinoma.

Moore, M. Elizabeth, Danbury, N. C.; Woman's Medical College of Pennsylvania, Philadelphia, 1928; county health officer; past-president of the staff of the Stokes-Reynolds Memorial Hospital, where she died July 27, aged 57, of cancer of the right ovary with metastases.

Morris, James Benjamin Ⓜ New Bedford, Mass.; College of Physicians and Surgeons, Boston, 1919; veteran of World War I; physician for the board of public welfare; died July 26, aged 63.

Morris, J. F., Harlingen, Texas (licensed in Arkansas in 1903); died July 8, aged 92, of cancer of the mouth.

Munch, Clarence J., Culbertson, Mont.; Jenner Medical College, Chicago, 1915; died July 18, aged 67, of myocardial infarction.

Nickel, Allen Arthur Clarence Ⓜ Bluffton, Ind.; Rush Medical College, Chicago, 1924; also an ordained minister; specialist certified by the American Board of Internal Medicine; member of the American College of Chest Physicians and the American Society of Clinical Pathology; fellow of the American College of Physicians; for two years president of the Wells County Medical Society; a partner in the Caylor Nickel Clinic; chief of the department of internal medicine, Clinic Hospital, where he died July 31, aged 63, of pulmonary embolism.

O'Connor, Ralph Edward, Buffalo; University of Buffalo School of Medicine, 1935; member of the Medical Society of the State of New York; associated with the Lafayette General Hospital and

Emergency Hospital (of the Sisters of Charity) died in the Buffalo General Hospital July 25, aged 59.

O'Keefe, Edward F., Howard, R. I.; Georgetown University School of Medicine, Washington, D. C., 1937; senior physician at the State Infirmary; died July 28, aged 47, of a cerebrovascular accident and cirrhosis of the liver.

Potts, Frank Tuthill Ⓢ Lacon, Ill.; Rush Medical College, Chicago, 1904; died in the Decatur and Macon County Hospital in Decatur, July 29, aged 82.

Purviance, Walter Ⓢ Pampa, Texas; Keokuk (Ia.) Medical College, College of Physicians and Surgeons, 1902; also a druggist; veteran of World War I; served as mayor; died in Evergreen, Colo., July 24, aged 78.

Rogers, Asa Holt, Philadelphia; Jefferson Medical College of Philadelphia, 1893; died July 30, aged 87, of arteriosclerosis.

Rutledge, Ralph Leyda Sr., Ⓢ Alliance, Ohio; University of Pittsburgh School of Medicine, 1916; member of the American Fracture Association and the American Academy of General Practice; past-president of the Ohio State Medical Association and the Stark County Medical Society; veteran of World War I; on the staff of the Alliance City Hospital; died in the Woman's Christian Association Hospital in Jamestown, N. Y., July 23, aged 65, of acute myocardial infarction.

Saferstein, T. Harry Ⓢ St. Joseph, Mo.; University of Kansas School of Medicine, Kansas City, Kan., 1930; veteran of World War II; associated with Missouri Methodist and St. Joseph's hospitals; died July 28, aged 52, of coronary occlusion.

Shane, Robert Shoemaker Ⓢ Pilot Mound, Iowa; State University of Iowa College of Medicine, Iowa City, 1912; served during World War I; veteran of World War II and served as state selective service medical director; died in Boone County Hospital in Boone July 30, aged 72, of infection and massive liver abscess.

Shanley, Emmet Baxter Ⓢ New Philadelphia, Ohio; Starling Medical College, Columbus, 1898; served as president of the Tuscarawas County Medical Society and the Seventh Councilor District Medical Society; for many years registrar of vital statistics in New Philadelphia; died July 21, aged 83.

Sheddan, William Joplin Ⓢ Osceola, Ark.; University of Tennessee College of Medicine, Memphis, 1915; veteran of World War I; member of the city council; chief of staff at Osceola Memorial Hospital; died in West Memphis July 24, aged 65, of injuries received in an automobile accident.

Shields, Robert Mansen Jr., Staten Island, N. Y.; University of Vermont College of Medicine, Burlington, 1921; member of the Medical Society of the State of New York; veteran of World War I; president of the Rotary Club of Staten Island; life consultant at Sea View Hospital; associated with Staten Island Hospital, where he died July 29, aged 62, of a heart attack.

Sochacki, Alexander S. Ⓢ Camden, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1928; member of the American College of Allergists; assistant in medicine at Jefferson Medical College of Philadelphia; on the staff of the Cooper Hospital; died July 26, aged 55, of acute coronary occlusion.

Thomasson, William Edward, Carrollton, Ga.; Atlanta College of Physicians and Surgeons, 1911; member of the Medical Association of Georgia; died in Atlanta June 30, aged 71.

Traywick, Asa Paul Ⓢ Cameron, S. C.; College of Physicians and Surgeons, Baltimore, 1902; died July 26, aged 79.

Van Iderstine, Reginald, Daphne, Ala.; College of Medicine and Surgery (Physio-Medical) Chicago, 1906; died July 26, aged 86, of bronchitis and heart disease.

Waddington, Algernon Henry, Rockford, Ill.; Chicago College of Medicine and Surgery, 1912; veteran of World War I; died in the Rockford Memorial Hospital July 29, aged 76, of hepatoma of the liver with ruptured esophageal varices.

Walliker, Wilbur Myron Ⓢ Clinton, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; past-president of Clinton County Medical Society; lifetime staff member of the Mercy Hospital and the Jane Lamb Memorial Hospital, where he was past-president of the staff; died July 24, aged 80, of coronary thrombosis.

Williams, Frank Spalding Ⓢ Villisca, Iowa; Rush Medical College, Chicago, 1901; for many years member of the board of education of Villisca; a director of the Villisca Building and Loan Association; died July 26, aged 86.

Witherington, Albert Sidney, Munford, Tenn.; Memphis (Tenn.) Hospital Medical College, 1904; died in the Methodist Hospital, Memphis, July 20, aged 74.

Wyman, Harry Hastings, Aiken, S. C.; Medical College of South Carolina, Charleston, 1897; past-president of the state board of medical examiners; served on the staff of the Aiken County Hospital; died in Rock Hill July 30, aged 83, of myocardial infarction and arteriosclerotic coronary thrombosis.

FOREIGN LETTERS

BRAZIL

Polyps and Malignancy.—Dr. Silvio Levy (*Revista do Hospital Matarazzo, São Paulo*) studied the relationship beween benign polyp of the colon and carcinoma. As evidences of such a relationship he cited the facts that both polyps and carcinomas are located in the various segments of the colon in almost equal percentage, the parallelism between the incidence of carcinomas and polyps of the colon in adults at different ages, the frequency with which the polyps are associated with rectocolic carcinoma, the transformation of nontreated polyps into carcinoma, the presence of adenomatous cells in many rectocolic carcinomas even in a late stage, and the high incidence of malignant degeneration in multiple polyposis. Patients with adenomas of the colon are believed to be more likely to develop a carcinoma of the colon than those who are free from adenomas. There is still some difference of opinion as to the criteria to be adopted by the pathologists concerning the diagnosis of malignancy in adenomas. Many of them do not recognize the existence of malignancy unless invasion of the tissue by the neoplastic epithelial elements is present, thus rejecting the concept of the confinement of malignant cells (carcinoma in situ).

The author reported a series of 67 patients with polyps of the colon. The incidence of carcinoma was 27%. One of the most important aspects of this series was the presence of malignant polyps in the first decade of life (25% of the cases). The incidence of polyps in 6,000 patients was 1.5%, which agrees with the figures of other Brazilian observers. The author recommends (1) sigmoidoscopy in every patient examined for the first time, regardless of age, (2) annual sigmoidoscopy in every patient over 40, (3) annual sigmoidoscopy and barium enema in all patients with a familial history of malignancy of the colon or with a previous polyp, even if it has been excised, and regardless of the patient's age, and (4) sigmoidoscopy and barium enema in all patients with rectal symptoms. This procedure should be repeated after six months if the first examination is negative.

Tuberculosis and Chickenpox.—The influence of chickenpox on 34 tuberculous children was studied by Dr. Paulo Vilhena de Morais (*Revista do Hospital das clinicas, São Paulo*, vol. 13, June, 1958) who concluded that (1) chickenpox rarely produces nonspecific alterations in the roentgenogram of the lungs or aggravates tuberculous foci in patients receiving specific treatment, (2) the regression of tuberculous lesions is not affected by chickenpox, (3) alterations of tuberculous sensitivity as a result of chickenpox are slight, and (4) chickenpox does not cause marked changes of the immunobiological state of tuberculous patients under specific treatment.

Neurofibromatosis.—Four patients with neurofibromatosis were studied by Franca and De Almeida, (*Arquivos de neuro-psiquiatria*, vol. 16, June, 1958). All of them had bilateral pontocerebellar tumors, an important diagnostic finding and the only manifestation of the disease in one patient who had the pure central form of the disease. In the others, with mixed types, besides various central lesions (neurofibromas, meningiomas) there were mild peripheral lesions. Intravertebral tumors originating from radicular sheaths were the cause of the initial symptoms in three patients. In the two in whom the cerebral cortex was studied, groups of atypical glial cells characteristic of the central type of neurofibromatosis were found. Two relatively rare lesions were found in the second patient (cortical angioma and hypertrophic interstitial neuritis of the brachial plexus). In patients with peripheral or intravertebral neurofibromatosis, as well as in their relatives, central lesions must be sought, especially tumors of the acoustic nerve. The diagnostic procedure of choice in such patients is ventriculography with iodized oil.

CANADA

Toxoplasmosis.—Harper and co-workers (*Canad. M. A. J.* 79:25, 1958) made a survey of the Toronto area to determine the incidence of positive skin reactions to toxoplasmin and the incidence of complement-fixing antibodies in the population. They found that the incidence of positive skin tests increased with age in the normal population, from 10% in the youngest group to 40% at ages over 35. None of the clinically normal persons with a positive skin or complement fixation test had any history or other evidence of toxoplasmosis. It would seem that inapparent and unrecognized toxoplasmosis is widespread in the Toronto area. A higher incidence of positive tests was present in medical students and laboratory workers than in the general population.

The items in these letters are contributed by regular correspondents in the various foreign countries.

Shellfish Poisoning.—Two epidemics of paralytic shellfish poisoning were reported in Canada in 1957, one in New Brunswick and one in British Columbia. Bond and Medcof (*Canad. M. A. J.* 79:19. 1958) described the New Brunswick epidemic in which 33 people were poisoned, though none died. The offenders were soft-shell clams and bar clams from the shore of the Bay of Fundy, whose toxicity is regularly assayed by the Department of Fisheries. When the toxicity rises above an arbitrary limit of 400 units, warning notices are posted and the consumption of the clams is considered dangerous. In spite of this, various persons gathered clams in full view of the notices and suffered the consequences. There was widespread variation in tolerance to doses of the toxin, symptoms including loosening of the teeth, respiratory difficulty, and numbness of the face, lips, tongue, and fingers. The speed of onset of symptoms in experiments suggested that the toxin might be absorbed through the oral mucosa.

The Surgeon's Fee.—A difficult problem arises when a visiting surgeon from the city operates on a patient in an outlying area, returns immediately to the city, and leaves the postoperative care in the hands of the local practitioner. What is the situation as regards the surgeon's fee, particularly when payment is being made in part or in whole by an insurance agency? Until recently, the reference committee of the British Columbia Division of the Canadian Medical Association has allowed some discretion in applying the general principle that the surgical fee is indivisible in such cases. Early this summer, however, a decision of the committee was published in the *Bulletin of the Vancouver Medical Association*. It has now been decided that when an operation is performed by a visiting surgeon, the surgical fee will not be divided and the surgeon will receive the total fee for the operation. When postoperative care is given by a local practitioner, he may find that the patient's insurance will not cover an extra fee for this. An editorial in the same issue criticized this directive on the grounds that division of a fee in such cases is not fee-splitting, which means getting paid for work not done, but a fair division of the reward according to the work done.

A State-Operated Diagnostic Center.—Although the province of Quebec has indicated as yet no intention to participate in the Federal-Provincial Hospital Insurance Plan, the provincial government decided to convert a former children's hospital in Montreal into a modern diagnostic center that will be the first of several to be built in the province. When this plan is put into operation, the first state-operated diagnostic center in Canada will have appeared. This is the outcome of six years of study. The new diagnostic center will be made available to general practitioners, placing at their disposal laboratory and other diagnostic facilities. The aim of the center will be to enable sick persons with insufficient financial resources to obtain a diagnosis at low or no cost and to assist family physicians in their work. This should not be taken as an indication that Quebec is heading towards state medicine, according to the premier.

Drivers' Licenses.—The Government of British Columbia worked out a scheme for obtaining a medical opinion on certain automobile drivers. Applicants for commercial chauffeurs' licenses, any persons over 70 years of age, and those under 70 years of age with a suspected medical condition contraindicating automobile driving are required to have a medical examination, but the onus is not placed on the family physician to decide whether the person is fit to drive or not. The applicant will forward the results of his medical examination to an official medical referee. The referee will review the findings and indicate whether a license should be approved or suspended, whether periodic examination should be required, or whether further examination is needed. The final decision will rest with the superintendent of motor vehicles, who will act on the recommendations of the medical referees. The government is asking for the cooperation of the medical profession during the developmental phase of this new program.

FRANCE

Treatment of Fatigue.—M. Albeaux-Fernet and coworkers (*Presse méd.* 66:1265, 1958) believe fatigue to be a minor response of the central nervous, neurovegetative, and endocrine systems to repeated aggression, as opposed to shock which represents a major response. Hormonal and metabolic investigations made it possible to divide this response into the following stages: (1) harmonious response (physiologic fatigue), (2) oscillating response, (3) discordant response (functional adrenal insufficiency), and (4) phase of exhaustion (polyendocrine involvement). The latter two stages represent pathological fatigue. Stage 2 is intermediate between acute and chronic fatigue. A series of 45 patients with stage 3 and 4 fatigue were given 20 mg. of adenosine triphosphate (ATP) intramuscularly for 20 to 40 days, followed by 25 mg. by mouth for 2 to 4 months. In patients with stage 3 fatigue ATP gave improvement of the general condition, increase in weight (by 1.5 kg. [3 lb.] as an average), a normalization of the blood pressure, and an improvement of the mental condition. ATP exerted a favorable action on various metabolites. The excitability of muscles to electrical stimulus that was diminished in 45% of the patients was re-established. Patients with stage 4 fatigue with total or partial deficiency of pituitary function benefited by ATP treatment glossitis, neurological involvement, or a megaloblastic bone marrow by months or even years. Vitamin B_{12} was given to nine patients, of whom three continued smoking as heavily as before. All recovered more rapidly than would have been expected with the prohibition of smoking and vitamin B complex by mouth alone; 100 mcg. of the vitamin was given parenterally once or twice weekly for a month, then every fortnight for two months and finally at intervals of a month. The authors believe that tobacco amblyopia and the retrobulbar neuritis of pernicious anemia may be manifestations of the same condition. In some of their patients tobacco amblyopia and neurological features suggesting vitamin B_{12} deficiency were associated with abnormal liver function tests and low serum vitamin B_{12} levels. In any patients with unexplained peripheral neuropathy, myelopathy, or encephalopathy, especially if it is considered to be due to nutritional deficiency, the levels of total and of free vitamin B_{12} in the serum should be measured.

Boen and co-workers stated that the diagnosis of vitamin B_{12} deficiency could be made from the examination of the nuclear changes in the oral epithelial cells (*Lancet* 2:294, 1958). Mouth washings were centrifuged, stained with May-Grünwald-Giemsa stain, and the diameters of 100 consecutive nuclei determined. Normally a maximum of 5% of the nuclei have diameters of 14.5μ or more; in patients with pernicious anemia the figure is 26%. Giant nuclei are present in the cells from the oral mucosa of patients with vitamin B_{12} deficiency. The authors diagnosed vitamin B_{12} deficiency in a patient who had subacute combined degeneration but no changes in the blood or bone marrow. The diagnosis was made from oral smears. Treatment with vitamin B_{12} produced improvement and normalization of the nuclei of the cells of the oral epithelium within a week. No changes were seen in the hemoglobin concentration, reticulocyte count, or serum iron level. The diagnosis was confirmed by demonstrating a low serum vitamin B_{12} level.

CORRESPONDENCE

CARIES-PRODUCING POTENTIAL OF CHOCOLATE

To the Editor:—It is a general belief that high acid production in dental plaque is one of the major causes for tooth decay. A recent study (Ludwig and Bibby, *J. Dent. Res.* 36:61-67 [Feb.] 1957) on the production of acids in dental plaque after the ingestion of various solid and liquid foods showed that milk chocolate produced the most acid. It was also found that the amount of acid does not depend solely on the carbohydrate content of the food nor on the amount of food retained in the mouth. No attempt was made to explain why milk chocolate produced the most acid.

A bacteriological study of chocolate milk (Fuller, Mueller, and Swanson, *J. Dairy Sc.* 25:883-894 [1942]) gives data which presumably could serve as a possible explanation for the high acid production in the mouth after chocolate has been eaten. From that investigation it was concluded that cocoa powders or chocolate syrups added to milk definitely inhibited the growth of bacteria likely to be found in milk, with the exception of Streptococcus lactis. Furthermore, it was concluded from studies with pure tannic acid that the tannic substances of the cacao products are the agents responsible for inhibiting bacterial growth. While the tannin complex in cacao products is not definitely known, the work of Doelger (*Am. Leather Chem. A. J.* 31:46-63, 531-544 [1936]; 32:265-275 [1937]) gives credence to the latter conclusion. Doelger reported that bacteria in tan liquors are largely acid-producing organisms, with lactic, acetic, and butyric acid producers in greatest abundance, and that Streptococcus lactis is the chief producer of lactic acid.

Mueller and Kuzmeski (*J. Dairy Sc.* 27:897-901 [1944]) analyzed 18 samples of commercial cocoa powder for tannin-like substances and found values ranging from 2.6 to 15.6%. While milk chocolate was not analyzed for tannin-like substances, calculated amounts of these substances are from 1 to 2%, depending upon the milk chocolate formulation.

In the light of the results from Fuller, Mueller, and Swanson's bacteriological study of chocolate milk, one would expect milk chocolate to produce a greater amount of acid than many other foods commonly consumed. Any inhibition of nonacid producing microorganisms by tannin-like substances should increase the growth of acid producers because of lack of competition. Fuller, Mueller, and Swanson also found that the inhibition of bacterial growth was greater at room temperature (72 F) than at refrigerator temperature (43 F). Therefore, one would expect a still greater inhibition at mouth temperature (98.6 F) with a further increase in acid production.

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MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Experience with Intramuscular Digoxin. E. Fletcher and C. F. Brennan. Irish J. M. Sc. 6:273-280 (June) [Dublin].

A preparation of digoxin suitable for intravenous as well as intramuscular administration is now available, permitting investigators to study the effect on the heart of digoxin administered intramuscularly with regard to the rapidity of action and to compare the results with intravenous administration under control conditions. Twenty patients were selected for study; 18 of these patients had uncontrolled auricular fibrillation with low output failure, 2 being included as they had persistent extrasystolic arrhythmia. Ten patients with auricular fibrillation were digitalized rapidly, and their condition was maintained with intramuscularly administered digoxin. Eight patients with auricular fibrillation were selected for comparative study of intramuscularly and intravenously administered digoxin, and in 6 of these the effect of concurrent digoxin and mersalyl was observed.

A satisfactory therapeutic response was obtained in 15 of the 18 patients with uncontrolled auricular fibrillation within a period of 5 to 19 hours by the intramuscular administration of 1 to 2 mg. of digoxin, irrespective of age, body weight, degree of congestive failure, or nature of underlying heart disease. With the exception of 1 patient, the maintenance dose for the 10 patients with auricular fibrillation after rapid digitalization was 0.5 mg. of intramuscularly administered digoxin every 8 to 24 hours. In 2 patients ventricular ectopic foci were completely abolished (although the sinus rate was not affected) by digitalis action within 3 hours of administration, indicating a direct myocardial effect of digoxin. In 9 patients initial vagal slowing lasted 2 or 3 hours; it was followed by a transient rise in the ventricular rate, which was replaced within the hour by a progressive fall to a minimum level about the 6th hour.

The response of the ventricular rate in auricular fibrillation to digoxin given intramuscularly compares favorably with the response to intravenous administration, irrespective of whether the dose (1 mg.) was within the therapeutic range. When 2 cc. of mersalyl was given at the same time as 1 mg. of digoxin, the fall in ventricular rate in each case tended to be more marked than when digoxin was given alone, either intramuscularly or intravenously. In 1 instance a therapeutic response did not occur, but with the dosage used, the intravenous route was not found to be superior to the intramuscular route. The intramuscular administration of digoxin may be painful, and this factor alone may limit its value in maintenance therapy. Nausea due to the central action of digoxin occurred in 2 cases, but only after large doses of the drug had been given. Toxic arrhythmias—paroxysmal auricular tachycardia, multiform ventricular extrasystoles, and bradycardia—were observed in 3 cases, indicating the direct action of digoxin on the myocardium and necessitating its temporary suspension and the institution of potassium therapy.

Fibroma of Bronchus. J. E. Rodó. Medicina 17:247-254 (Oct.-Dec.) 1957 (In Spanish) [Buenos Aires].

Fibroma of the bronchus is a rare tumor. It is histologically benign, but its rapid growing may cause closure of the bronchus, resulting in death of the patient. The symptoms consist of asthma, pulmonary suppuration, and atelectasis. The diagnosis and, if possible, the removal of the tumor are made by endoscopy. A man, 40 years old, was hospitalized with fever and moderate dyspnea. He had chronic bronchitis, asthma, and pulmonary suppuration of 6 months' duration. Auscultation and roentgenologic examination of the chest showed a total atelectasis of the right lung, deviation of the mediastinum, and several enlarged mediastinal lymph nodes. A tumor in the main bronchus prevented the passage of the bronchoscope. A diagnosis of bronchogenic carcinoma was made, and an exploratory thoracotomy was planned, which the patient refused. The bronchial symptoms were relieved by the administration of antibiotics and sulfonamides. The picture of atelectasis was not modified. After discharge from the hospital, the patient had 10 applications of deep roentgentherapy. He also had a treatment with nitrogen mustard up to a total dose of 50 mg. Histological examination of an excised axillary lymph node, of a piece of bronchial mucosa taken during bronchoscopy, and of the sputum was

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The place of publication of the periodicals appears in brackets preceding each abstract.

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negative for cancer. An exploratory thoracotomy was made 8 months after the first consultation of the patient. In sectioning the right bronchus, a pink polypoid tumor joined to the carina by a pedicle was extirpated. A pneumonectomy of the right lung was performed. The postoperative period was uncomplicated. Histological examination of the tumor and of the right lung showed fibroma of the bronchus, bronchial obstruction, atelectasis and sclerosis of the lung, and bronchial dilatations. The patient is in normal health 18 months after the operation.

Homozygous Hemoglobin C Disease: Report of 3 Cases. K. R. Tanaka and G. O. Clifford. Ann. Int. Med. 49:30-42 (July) 1958 [Lancaster, Pa.].

The authors report on 3 Negro women, aged 28, 32, and 67 years, respectively, with homozygous type C hemoglobin disease. All the patients had a fairly uniform clinical course, characterized by the presence of a mild but constant hemolytic anemia, with periodic episodes of jaundice which cleared spontaneously, variable degrees of enlargement of the liver, and marked enlargement of the spleen. Although fleeting arthralgias have been reported by other workers, none of the 3 patients had this symptom. The oldest patient underwent surgical treatment for an intertrochanteric fracture of the left femur caused by a fall. She had a rapid drop in hemoglobin value accompanied by an increase in bilirubin, and it is likely that she had a hemolytic crisis, perhaps precipitated by the surgical procedure. Although mild to moderate anemia was presumably present in all the patients throughout life, in none of them was it severe enough to require blood transfusions, except after the surgical procedure in the patient mentioned before. Low-grade reticulocytosis was present at times in all the patients. The outstanding hematological characteristics were the presence of numerous target cells in the blood smear, increased osmotic resistance to hypotonic sodium chloride solution, increased fecal urobilinogen excretion, slight but fluctuating icterus, mild reticulocytosis, and bone marrow studies compatible with hemolytic anemia. Hemoglobin electrophoresis in each patient revealed a 50% red blood cell survival time of 21 days. Studies of iron metabolism (ferrokinetics) utilizing radioiron (Fe^{59}) showed that the plasma iron disappearance half-time was shortened and that the incorporation of the injected tracer dose into the red blood cells was within the lower limits of normal. No hemoglobin other than type C was detected by paper electrophoresis. The diagnostic problem presented by these patients was resolved by the relation of all the clinical manifestations to the presence solely of type C hemoglobin. The possibility of homozygous type C hemoglobin disease should be considered when one is confronted with a Negro patient who has enlargement of the liver and spleen and mild hemolytic anemia without sickling, and hemoglobin electrophoresis should be performed.

Host Factors in Polycythemia Vera. A. Damon and D. A. Holub. Ann. Int. Med. 49:43-60 (July) 1958 [Lancaster, Pa.].

The authors report on 132 men and 65 women with polycythemia vera who were admitted to the Presbyterian Hospital in New York between 1937 and 1957. The average age of the patients at onset of the disease, which did not differ between the sexes or among various ethnic groups, was 53.7 years. In 1 patient, however, the disease was first diagnosed at the age of 9 years. This was one of the earliest cases on record of polycythemia vera; it was apparently primary and was unaccompanied by congenital anomalies. The patient led an active life without therapy or complications of his disease for 15 years after the diagnosis was made. The percentage of Negroes (3.6%) with polycythemia vera was significantly lower than the percentage of Negroes (16.4%) among the Presbyterian hospital population, and the percentage of Jews (33%) with this disease was significantly higher than their percentage among the hospital population. Both of these findings confirm previous impressions, but the Jewish preponderance was about 2 to 1 less than that usually quoted (4 or 5 to 1). The disease tended to be mild among the Negroes. Polycythemia vera occurred among white groups, other than Jewish, with the frequency expected from their hospital distribution.

Contrary to the impression of some of the workers that patients with polycythemia vera tend to be slender in build, no real difference was found between such patients and normal controls in height and weight; men with polycythemia vera and hypertension were stockier than those without hypertension, but the number of these patients was small. Patients with polycythemia vera did not differ from comparison series in the same hospital regarding ABO blood-group incidence, age at menarche, and age at menopause. Other disorders and complicating illnesses were associated with polycythemia vera in about the proportions previously reported; these conditions included hypertension (32%), arteriosclerosis (30%), peptic ulcer (14.5%), thromboses of extremities (9.5%), myeloid dyscrasias (7.6%), and gout (5.5%). Ten of the 15 patients with myeloid dyscrasias had received previous irradiation therapy. Uterine fibroids occurred in 13 (33.3%) of 39 women with adequate history or pelvic examination. A unique case was presented of polycythemia vera occurring coincident with fibroids, disappearing after hysterectomy, and recurring as polycythemia vera 5 years later. Hypernephroma was observed in 9 patients (4.4%); 2 of these patients have had complete hematological remissions after nephrectomy for 2 and 11 years, respectively, to date. The indication for urologic investigations of hematuria in patients with polycythemia vera was noted.

Coronary Disease, Hypercholesterolaemia and Its Treatment. M. F. Oliver. Scottish M. J. 3:225-234 (June) 1958 [Glasgow].

The author feels that the increase in the mortality and morbidity from coronary disease is so striking that there are probably several extraneous factors contributing to it: 1. More people are living longer than at the beginning of this century, and, since coronary atheroma generally increases with advancing age, coronary disease is more likely to be a cause of death in today's older population. 2. There may have been changing fashions in death certification, and many deaths which in the past were certified as cardiovascular or myocardial degeneration are probably now registered as coronary disease. 3. Both the medical profession and the public are now more aware of coronary disease than in the '20s. This awareness has undoubtedly contributed to the increased frequency of diagnosis, which is often made erroneously. Hypercholesterolemia and other abnormalities in the circulating lipids are most marked in young patients with clinical coronary disease. It is suggested that the etiology of coronary disease is more closely related to disorders of the circulating lipids in young patients than in older patients. At present there is no really effective or acceptable method of lowering hypercholesterolemia. Restrictions or alterations of the diet are monotonous and unpleasant, but studies of the addition of unsaturated vegetable oils to the diet are encouraging. Thyroid analogues and estrogens lower hypercholesterolemia, but the former probably increase myocardial metabolism, even in the absence of any effect on basal metabolic rate, and the latter induce feminization to a greater or less degree. There is no satisfactory evidence that reduction of hypercholesterolemia reduces mortality and morbidity or that it inhibits the atherosclerotic process in man.

Anticoagulant Therapy in Acute Myocardial Infarction. R. L. Richards. Scottish M. J. 3:235-244 (June) 1958 [Glasgow].

Many workers have suggested that anticoagulant therapy can effect a significant reduction in the mortality rate in the weeks immediately after an acute myocardial infarction, and that it can also lower appreciably the number of clinically detectable but nonfatal thromboembolic complications. There have been few reports in which the effects of anticoagulant therapy upon the over-all mortality rate from myocardial infarction in 1 hospital or in a single medical unit have been studied. The author reports the results which have followed the introduction of this therapy. The clinical material consisted of patients with acute myocardial infarction admitted to the medical unit at the Western Infirmary, Glasgow, during the years from 1949 to 1956. It included not only those patients in whom the primary diagnosis was myocardial infarction but also those patients who experienced an infarction after admission for some other condition. The diagnosis was confirmed in all cases either by electrocardiography or at autopsy.

Over a period of 13 years (1944-1956) the death rate from acute myocardial infarction remained remarkably constant; about a third of the patients died in the hospital in the first few weeks. The introduction of anticoagulant therapy was not followed by a significant alteration in the mortality figures. The present series is comparable with others in respect of the incidence of thromboembolic and hemorrhagic complications. It is pointed out that, even when a policy of giving anticoagulants to all patients with acute myocardial infarction is adopted, there will always be a proportion of patients who cannot be so treated. The reasons for the high death rate and for the failure of anticoagulants to influence this are the large number of patients who die soon after admission (one-third of all deaths) and a high mortality rate in patients who, for one reason or another, cannot be given anticoagulants. The author suggests that, in some other reported series of patients treated with anticoagulants, methods of case selection may have influenced the results. To obtain convincing proof of the beneficial effects of anticoagulant therapy in acute myocardial infarction, a reduction in the over-all hospital mortality rate should be demonstrable. The present investigation has not provided the evidence necessary to support this opinion.

Coronary Arterial Occlusion and Its Myocardial Consequences in Coronary Atherosclerotic Cardiopathy (A Study of 212 Cases). J. Himbert and J. Lenègre. Arch. mal. coeur 51:441-459 (May) 1958 (In French) [Paris].

The relations between coronary and myocardial lesions were studied in 212 cases of coronary atherosclerotic cardiopathy. Investigations showed that 193 of the 212 hearts had sustained 517 occlusions, 281 of which were atherosclerotic and 236 thrombotic in origin. These occlusions were distributed as follows: anterior trunk, 211 (*i. e.*, left coronary artery, properly speaking, 6; anterior interventricular artery, 205); right coronary artery, 167; and left coronary artery, 139. The proximal arterial segments were affected in 292 instances, the middle arterial segments in 165, and the distal arterial segments in 60. Major myocardial lesions, notably transmural infarcts, were observed in 59% of the anterior trunk occlusions, in 46% of the right coronary artery occlusions, and in 27% of the left coronary artery occlusions. They occurred in 51% of the proximal segment occlusions, in 27% of the middle segment occlusions, and in 16% of the distal segment occlusions. They were found in 35% of the atherosclerotic occlusions and in 65% of the thrombotic occlusions. The number of myocardial lesions in each heart increases in proportion to the number of occluded branches and occlusions, so that the average number of infarcts in each heart rises regularly from 0.66 for 1 occlusion to 1.40 for 6 occlusions or more. These findings suggest that the type of arterial occlusion exerts a preponderant influence in the pathogenesis of myocardial lesions in coronary atherosclerosis.

Clinical and Laboratory Observations in an Outbreak of West Nile Fever in Israel in 1957. I. Spigland, W. Jasinska-Klingberg, E. Hofshi and N. Goldblum. Harefuah 54:280-281 (June 1) 1958 (In Hebrew with English Summary) [Tel-Aviv, Israel].

The authors report on the clinical and laboratory findings obtained from 419 patients with West Nile fever which broke out in the summer of 1957 in the Shomron area. The study concerns 297 soldiers from this area, 65 children and adults in the town of Hadera and vicinity, and 49 aged persons from homes in Ein Shemer and Pardes Hanna. Attempts to isolate the West Nile virus directly from the acute-phase blood sample and complement-fixation and neutralization tests for West Nile virus on paired serums were carried out in 247 patients. The results disclosed West Nile fever in 88.9% of the soldiers, in 46.0% of the inhabitants of Hadera, and in 53.5% of the aged persons. The clinical picture differed in the 3 groups. The course of the disease in the soldiers was characterized by fever, lymphadenopathy, and rash; in 1 patient meningoencephalitis developed. The symptoms and signs were typical but rather mild among the majority of the children of Hadera and vicinity. In several children there was involvement of the intestinal or the respiratory tract; 2 patients developed meningoencephalitis. The clinical picture of the disease in the aged was characterized by the absence of symptomatic signs typical of West Nile fever, and a high percentage of patients developed meningoencephalitis. Of 49 aged persons, only 33 had fever of varying degree and duration, while 12 exhibited severe neurological signs and symptoms of meningoencephalitis. These 12 patients recovered promptly, whereas 4 other aged patients developed impaired consciousness with signs and symptoms suggesting severe brain damage and died after a fulminating course. In 1 of these patients examination at autopsy revealed diffuse encephalitis. The appearance of complement-fixing antibodies was retarded, and the titer was lower in the aged than in the young.

Further Considerations on the Treatment of Tuberculous Meningitis. C. Giova and A. Di Ruggiero. Riforma med. 72:558-560 (May 17) 1958 (In Italian) [Naples].

The authors report on the therapeutic results in 2 groups of patients with tuberculous meningitis. A report on one group was prepared in 1954, whereas the other group included patients observed from 1954 until now. The first group consisted of 40 patients, 21 of whom died by 1954; 1 more patient died during the second relapse. The period after discharge of the patients in the first group has varied from 5 to 8 years. During this time a blind patient partially regained his eyesight, a deaf patient has remained such, 1 patient who was discharged in good mental state is mentally deficient now, and 3 women have had children without complications. These results are probably permanent.

The second group consisted of 25 patients, 10 of whom died. Tracheobronchial adenopathy was present in 9 patients, miliary process in 10, and nodular infiltration in 1. Both groups were given streptomycin calcium chloride or dihydrostreptomycin either by the oral route in daily doses of 20 or 30 mg. per kilogram of body weight or by the intrathecal route in daily doses of 1 to 3 mg. per kilogram of body weight. Isoniazid was added to streptomycin in daily doses from 5 to 10 mg. per kilogram of body weight. Eighteen patients (45%) were cured in the first group and 15 (60%) in the second. Thus, better results in the treatment of tuberculous meningitis obtained in recent years are related to a more prompt correct diagnosis of the disease and to the use of better therapeutic methods.

The Diagnosis of Cancer of the Pancreas, Biliary Tract, and Duodenum by Combined Cytologic and Secretory Methods: I. Exfoliative Cytology and a Description of a Rapid Method of Duodenal Intubation. H. F. Raskin, J. Wenger, M. Sklar and others. Gastroenterology 34:996-1008 (June) 1958 [Baltimore].

The authors describe a method of rapid intubation of the duodenum for exfoliative cytological studies and report the results obtained in 203 patients suspected of pancreatic or biliary carcinoma. A double-lumen radiopaque tube (the Diamond tube) has been found to be satisfactory. One lumen, the duodenal segment, extends 26 to 29 cm. beyond the shorter gastric section. A metal olive, weighing 2.5 to 5.0 Gm., caps the distal end of the duodenal extension. After fasting overnight, the patient is given an intramuscular injection of 160 mg. of pentobarbital 1 hour prior to intubation. The tube is passed orally for a distance of 45 cm.; the metal olive is situated in the cardia. One end of a low bench or table is raised approximately 16 in. The patient lies head elevated in the left lateral decubitus position and slowly swallows 15 cm. of additional tubing. The excess tubing lies along the greater curvature. The patient then assumes a sitting position and bends forward at the waist as far as possible, taking several deep inspirations. This maneuver facilitates the entrance of the tip of the tube into the antrum as the anterior wall of the stomach falls away from the posterior wall. The procedure continues with the patient lying in the right lateral decubitus position with feet elevated for 5 minutes, during which time the tube will usually enter the duodenum. The patient is then placed on his back for an additional 3 to 5 minutes. During these last 2 steps, 10 to 15 cm. of additional tubing is slowly introduced. The location of the tube is determined fluoroscopically, and the tip is placed at the midportion of the third part of the duodenum. The gastroduodenal tube is then taped to the cheek to maintain position, and drainage is initiated with the patient lying on his back or right side on an examining table. Diagrams illustrate the different postures.

Duodenal entrance time can in most instances be reduced to 15 minutes. Occasionally the maneuver must be repeated because of coiling of the tube; this twisting is often due to the fact that the tube is passed too rapidly. The double-lumen tube drains the alkaline duodenal content independently of the acid gastric secretion. Pancreatic secretion should not be collected until adequate gastric drainage has been completed. The introduction of 200 cc. of air through the gastric lumen, followed by aspiration with the patient inclined toward the right lateral position, will facilitate complete emptying of the stomach. The gastric and duodenal tubes are then connected to a constant vacuum pump with pressure of 120 mm. Hg. The gastric juice is carried directly into a collecting jar and is discarded, but the duodenal aspirate is diverted by a simple trap which consists of 50-cc. plastic centrifuge tubes immersed in an ice bath. The pH of both drainages are determined repeatedly in order to insure that the collections are separate. Carcinoma was demonstrated subsequently by either surgery or biopsy or at autopsy in 43 of the 203 patients. Malignant cells were recovered in 28 of the 43 cases of pancreatic, biliary, gallbladder, and duodenal carcinoma.

The Diagnosis of Cancer of the Pancreas, Biliary Tract, and Duodenum by Combined Cytologic and Secretory Methods: II. The Secretin Test. J. Wenger and H. F. Raskin. Gastroenterology 34:1009-1017 (June) 1958 [Baltimore].

Whereas part 1 of these 2 papers was concerned with the duodenal intubation technique, the second paper is concerned with the secretion test and the combined use of these 2 methods in 199 patients with suspected biliary or pancreatic carcinoma. In addition 3 patients with carcinoma of the pancreas were diagnosed by cytological study alone, without the secretin test, although secretin was used as a stimulant; 1 other patient with carcinoma was studied with the secretin test alone. When the combined cytological-secretory method was employed, 1 unit of secretin per kilogram of body weight was injected intravenously over a 2-minute period after a 20-minute control collection period. Three 10-minute collections were placed in iced plastic tubes, centrifuged, and decanted into a graduate. The sediment was employed for exfoliative cytological examination, and the fluid for bicarbonate and enzyme analysis. With previously published standards as a guide, the secretory rate was expressed in terms of milliliters per kilogram of body weight for the 30-minute period after injection. The bicarbonate content was determined by means of the standard volumetric Van Slyke apparatus, checked against the manometric method on several occasions.

Since many studies of enzyme output in the secretin test have varied considerably, a new and extremely sensitive lipase determination was adopted instead of the more commonly used methods; the results are calculated in terms of micromoles of α-naphthol liberated per hour from a subtrate of naphthyl laureate per milliliter of original sample. The "normal" values for volume output and bicarbonate concentration were ascertained in 15 patients without pancreatic disease as compared with the results in 9 patients with proved carcinoma of the pancreas, 2 with carcinoma of the common bile duct or gallbladder, and 10 with various nonmalignant gastrointestinal diseases. Normally the volume of duodenal fluid should exceed 1.1 ml. per kilogram in the 30-minute collection period after secretin injection; the bicarbonate concentration should be 90 mEq. or greater in at least 1 of the 3 10-minute collections. The secretin test is most sensitive in tumors of the head and body of the pancreas. Abnormal results should always be interpreted with caution, as other disease entities or improper technique may give rise to "false-positive" findings. Analysis for pancreatic enzymes does not add appreciably to the diagnosis of pancreatic malignancy, and its omission will simplify the technique. Although slightly less sensitive than the secretin test, exfoliative cytology is important because of its high degree of specificity. For tumors of the biliary tract outside the pancreas, cytological examination is an excellent method of establishing the diagnosis. An 86% accuracy of diagnosis of carcinoma of the pancreas and biliary system was obtained through the combined use of the secretin test and exfoliative cytology.

Diagnostic Value of Radioactive Vitamin B_{12}. W. R. Pitney and J. B. Stokes. Australasian Ann. Med. 7:126-131 (May) 1958 [Sydney, Australia].

Patients with pernicious anemia differ from normal subjects in their ability to absorb vitamin B_{12} from the gastrointestinal tract. The absorption of radioactive vitamin B_{12} can be demonstrated in several ways. Some investigators measured the radioactivity excreted in the feces of their patients for several days after an oral dose of the vitamin. The recent introduction of radioactive vitamin B_{12} of high specific activity made it possible to measure plasma radioactivity several hours after the oral administration of the vitamin. Schilling in 1953 introduced a urinary excretion test to ascertain the absorption of radioactive vitamin B_{12}. When a small oral dose of radioactive vitamin B_{12} is absorbed from the intestine, little or no radioactivity appears in the urine. However, if a large parenteral injection of nonradioactive vitamin B_{12} is given to the patient at the same time, or a few hours after the orally administered radioactive dose, radioactivity appears in the urine together with most of the injected vitamin. The urinary radioactivity excreted in 24 hours is usually about one-third of absorbed radioactivity, and its measurement may be taken as an index of absorption from the intestine.

The authors studied the intestinal absorption of orally administered radioactive vitamin B_{12} by a modified urinary excretion test. Subjects were given a standard oral dose of 0.6 mcg. of vitamin B_{12} labeled with radiocobalt (Co^{60}). The mean 48-hour urinary radioactivity in 22 control individuals was 23.9% of the oral dose. In 5 patients with megaloblastic anemia due to folic acid deficiency, a similar mean excretion of 22.4% was found. In 15 patients with pernicious anemia in relapse, impaired absorption of radioactive vitamin B_{12} was demonstrated. The mean urinary radioactivity was 2.4%. This was increased to 19.6% when the oral dose was given with an intrinsic factor preparation. Twenty-five patients on maintenance therapy because of a previous diagnosis of pernicious anemia were studied. The diagnosis was disproved in 10 patients, who were shown to be able to absorb orally administered radioactive vitamin B_{12} normally.

The Use of the Schilling Test in the Diagnosis of Pernicious Anemia and Allied Conditions. J. Abels, M. G. Woldring, J. J. M. Vegter and H. O. Nieweg. Nederl. tijdschr. geneesk. 102:869-873 (May 3) 1958 (In Dutch) [Amsterdam].

The authors investigated the absorption of vitamin B_{12} labeled with radioactive cobalt by employing a modification of Schilling's urinary excretion technique. Their studies were made on 20 patients with pernicious anemia and on a control group of 30 patients. After giving 1 mcg. of vitamin B_{12} labeled with radiocobalt ($Co^{58[57]}$) by mouth, the patients were given flushing doses of 1 mg. of nonradioactive vitamin B_{12} by subcutaneous injection 2 hours and 24 hours later. The urinary excretion of radioactivity amounted to an average of 29.2% (a range of 14.2 to 46.4%) in the 30 normal subjects, whereas in the 20 patients with pernicious anemia only an average of 1.8% (a range of 0.1 to 4.4%) of radioactivity was excreted in the urine. Eighteen of the pernicious anemia patients were subsequently given 25 ml. of neutralized human gastric juice together with the orally administered dose of radioactive vitamin B_{12}. When this was done, the urinary excretion of radioactivity increased to an average of 21.2% (a range of 11.9 to 35.9%).

Vitamin B_{12} absorption is frequently impaired in patients with sprue. The authors found that in 4 out of 5 patients the absorption defect was not corrected by the simultaneous administration of intrinsic factor. They assume that renal dysfunction might be responsible for a decreased excretion. They conclude that the Schilling urinary excretion test of radioactive vitamin B_{12} is a reliable technique in the diagnosis of atypical pernicious anemia (neuropathy without blood dyscrasia or after remission) and in the differential diagnosis of megaloblastic anemias. They illustrate this with some case histories.

Principles of Prognosis in Patients with Hodgkin's Disease. L. Justin-Besançon, S. Lamotte-Barrillon and D. Lubetzki. Semaine hôp. Paris 34:1698-1703 (June 12) 1958 (In French) [Paris].

The authors examined from a histological and biological standpoint the duration of survival and prognosis in patients with Hodgkin's disease. Only patients in whom the diagnosis had been established by histological examination have been selected. The average time of survival in this series was 4 years and 1 month from the onset of the disease. Of 72 patients examined as to age at onset and survival, 6 were 50 years or older at onset, and 3 of them died within less than 6 months. The disease is of unfavorable character if it occurs at an advanced age, whereas in patients between the ages of 30 to 40 years it shows a more favorable course. This study reveals no statistically significant differences as to sex. Thirty-five men survived 4.29 years, whereas 39 women survived an average of 3.66 years. The average time of survival in 33 afebrile patients was 4.9 years and in 36 febrile patients 3 years. The development of the disease showed no significant difference between patients in whom mediastinal adenopathy occurred in the initial stage and those showing no mediastinal adenopathy. It is impossible to base a prognostic evaluation on the histological aspect of the lesions. The same applied to both the results of skin reaction tests and those of protein electrophoresis which are devoid of prognostic value. In 16 patients in whom anemia was present during the initial stage of Hodgkin's disease, the survival time averaged 2.33 years, whereas in those patients without anemia the average survival time approached 4.90 years. There were no significant differences in pregnant patients or in those patients exhibiting pruritus as to age at onset and survival time. No correlation exists between duration of survival and demonstration of negative skin tubercular reaction; on the contrary, the survival time in those patients with a positive skin reaction was somewhat less than that in those with a negative reaction. Radiotherapy and nitrogen mustard therapy are considered the most effective, but the latter is accorded a somewhat higher rank in the therapeutic regimen. Dosage is variable and is of no prognostic value, as is the interval between the appearance of the initial signs and symptoms and their remission. The period of alleviation after the initial therapy is considered to be of great prognostic value. The patient is always liable to recurrences and relapses, since no form of therapy has been found that insures permanent relief from Hodgkin's disease. The existing therapeutic regimens have little, if any, effect on the duration of survival; however, they do provide some palliation.

Giant Follicular Lymphoblastoma: Its Treatment with Radioisotopes. J. H. Lawrence and W. G. Donald Jr. Ann. Int. Med. 49:1-16 (July) 1958 [Lancaster, Pa.].

The authors report the clinical and pathological findings in 12 men and 8 women, between the ages of 32 and 65 years, with giant follicular lymphoblastoma; 16 of the patients were followed to death, 2 are still living, and 2 were lost to follow-up. All the patients showed a fairly generalized involvement of lymph nodes, but the cervical lymph nodes only were initially involved in 11 patients. The spleen was enlarged in 17 patients, and the liver was enlarged in 8. Anemia was present in 14 patients, and leukopenia in 11. Three patients had absolute lymphocytosis or "lymphemia." One patient had a typical chronic lymphocytic leukemia. There was a marked lack of correlation between the duration of the disease and the relative benign or malignant appearance of the lesions histologically. Sixteen patients were treated with radiophosphorus (P^{32}). Small doses of P^{32} ranging from 1 to 5.1 mc. were given intravenously at intervals varying from 1 week to 2 months. The total dose given a single patient, successfully treated, varied from 6 to 44.3 mc. Five patients received this therapy while in the terminal stage of their illness and showed no response. Eleven patients received adequate radiophosphorus therapy. Three patients showed excellent response, with complete remission occurring in 1 and nearly complete remission in 2. Three patients showed good responses, with duration of control lasting from 7 to 20 months. Three patients showed a fair response but required additional local x-ray therapy for control. Two patients showed no response. The average duration of the disease in 10 of the 11 adequately treated patients who were followed to termination was 6.7 years, compared with the average duration of 6 years or less reported in the literature. Radiophosphorus therapy combined with local x-ray therapy, or alone, may be the treatment of choice in giant follicular lymphoblastoma and deserves serious consideration, particularly in those patients with widespread involvement.

Plasma-Transaminase Activity as an Index of the Effectiveness of Cortisone in Chronic Hepatitis. E. N. O'Brien, A. J. Goble and I. R. Mackay. Lancet 1:1245-1249 (June 14) 1958 [London].

Active chronic hepatitis is a relapsing inflammatory process believed to be a sequel to overt or subclinical viral hepatitis. The liver at autopsy presents the features of so-called postnecrotic cirrhosis. In some cases the lupus erythematosus (L. E.) cell test and the autoimmune complement-fixation test may be positive. Perpetuation of the hepatitis may depend on an immunological disorder and may be favorably modified by cortisone. In the absence of other visceral disease the level of glutamic oxaloacetic transaminase in the plasma provides a sensitive index of the degree of liver-cell necrosis.

In 10 patients with chronic liver disease, the rate of liver-cell necrosis was followed by serial estimations of glutamic oxaloacetic transaminase activity in the plasma before and during cortisone treatment. In 4 of 5 patients with active chronic hepatitis, a pronounced fall in transaminase levels coincided with cortisone treatment. In 5 patients with chronic liver disease of different etiology, there was no significant fall in transaminase value with cortisone treatment. This limited study supports the use of cortisone in acute exacerbations of active chronic hepatitis but sheds no light on the effect of cortisone on the ultimate outcome of the disease. It could be argued, however, that rapid control of the necrotic process might lessen hepatic scarring and disorganization.

Diagnostic Value of Serum-Transaminase Activity in Hepatic and Gastrointestinal Diseases. J. Pryse-Davies and J. H. Wilkinson. Lancet 1:1249-1253 (June 14) 1958 [London].

Determination of serum glutamic oxaloacetic transaminase activity is widely used as a diagnostic test in acute myocardial infarction and diseases of the liver. The liver has been shown to be the main source of serum glutamic pyruvic transaminase. The work described here was done to find out whether the determination of serum transaminase activity should be recommended for inclusion in the routine liver-function tests. More than 1,000 determinations were done on 226 patients and 50 healthy controls. The patients included 66 with ulcerative colitis, of whom 10 had hepatic complications, 13 with obstructive jaundice, 15 with infective hepatitis, 27 with either cirrhosis or chronic hepatitis, 27 with hepatic metastases, 11 with cholecystitis, 35 with miscellaneous diseases of the intestinal tract not involving the liver, and 25 without organic disease.

The authors emphasize that the precision and sensitivity of the spectrophotometric method of determining serum glutamic oxaloacetic transaminase and glutamic pyruvic transaminase levels have been improved by the application of temperature corrections. They suggest that values over 40 serum glutamic oxaloacetic transaminase units per milliliter and 30 serum glutamic pyruvic transaminase units per milliliter be regarded as abnormal, provided that the results have been corrected to 25 C (77 F). It was confirmed that high values (more than 500 units per milliliter) for both enzymes are characteristic of infective hepatitis and carbon tetrachloride poisoning. Moderately raised values (100-300 units per milliliter) occur in obstructive jaundice, glandular fever hepatitis, and toxic hepatitis (excluding that due to carbon tetrachloride). Variable results were obtained in cirrhosis and liver metastases, but in 64% of the patients the serum glutamic oxaloacetic transaminase level was raised above normal values, whereas only about 40% showed increased serum glutamic pyruvic transaminase activity. Normal values were obtained in gastrointestinal diseases not involving the liver. The serum glutamic oxaloacetic transaminase level showed a moderate and transient rise (up to 300 units per milliliter) in myocardial infarction, but in this condition the serum glutamic pyruvic transaminase level usually remained normal. Serum glutamic pyruvic transaminase activity was thus of considerable value in confirming the hepatic origin of serum glutamic oxaloacetic transaminase in certain cases. Used critically in conjunction with other liver-function tests, transaminase determinations were extremely useful.

Contribution to the Study of Agammaglobulinemia and Hypogammaglobulinemia.

M. Antonucci and P. Mugnaini. Minerva pediat. 10:427-431 (April 14) 1958 (In Italian) [Turin, Italy].

The object of this study was to determine by electrophoretic measurement the incidence of primary agammaglobulinemia and hypogammaglobulinemia in infants and children who show extreme susceptibility to bacterial infection. This series included 1,098 infants and children, ranging in age from 58 days to 12 years, who were brought for observation to the University Clinic of Modena for recurrent episodes of sepsis, infections of the respiratory tract, and pyoderma. This investigation included as control all infants under 12 months of age, because some patients with this disorder have an immunological response similar to normal persons. Absence of or a diminution in the level of gamma globulins, accompanied by a low alpha globulin serum concentration, was found in 4 infants (3.64 per mille), none of whom belonged to the control group. One infant, aged 2½ months, had agammaglobulinemia, and the other 3, who ranged in age from 2 months to 2 years, had hypogamaglobulinemia. The 4 patients were brought to the clinic because of an acute infection of the respiratory tract. Electrophoretic analysis of the serum of the relatives of the infant with agammaglobulinemia revealed normal concentration of serum components. Retarded means of producing gamma globulin were probably responsible for the disorder in this infant. He also had a low white blood cell count, which might be related to the hypoplasia of the lymphatic tissue, with the subsequent failure to produce antibodies. The infants with hypogammaglobulinemia were brought back to the clinic for observation because of bronchopulmonary disturbances several times after the discharge.

SURGERY

The Effective Level of Lumbar Sympathectomy: As Determined by Electrical Stimulation at Operation.

W. C. Randall, W. J. Pickett, F. A. Folk and H. J. McNally. Ann. Surg. 148:51-58 (July) 1958 [Philadelphia].

The technique of direct electrical stimulation of the sympathetic nervous system has been applied to man. Sweating responses were recorded simultaneously from the complete circumference of the thigh, calf, and foot by the iodine starch paper technique. Sweating was widespread over the entire surface of the lower extremity in response to localized stimulation of the lumbar sympathetic system in some patients, while in others sweating was restricted to small areas, with marked variation in patterns of sweating as the position of the stimulation electrodes was shifted from one level to another. It is evident from the records of 2 different sympathetic trunks that a remarkable variation exists in the patterns of sympathetic (sudomotor) innervation of the lower extremity. In the first patient only sparse and scattered sweating was induced on any surface of the extremity, whereas profuse sweating was elicited on nearly all areas in the second patient, indicating that these segments of each of the individual sympathetic trunks contained entirely different proportions of the total number of sudomotor fibers supplying the lower extremity. The variations present in response to electrical stimulation of the same segment in different sympathetic trunks emphasize the fact that the surgeon may not predict with assurance the extent or magnitude of sympathetic denervation which will result from extirpation of an arbitrarily designated ganglion or small segment of the lumbar sympathetic trunk, and point out the fallacy inherent in conventional procedures which dictate the extirpation of the same segment of the lumbar trunk in all patients.

Chronic Regional Enteritis: A Survey of One Hundred Twenty-Six Cases Treated at the Massachusetts General Hospital from 1937 to 1954. B. B. Jackson. Ann. Surg. 148:81-87 (July) 1958 [Philadelphia].

This study represents a survey of 126 cases of chronic regional enteritis treated at the Massachusetts General Hospital, Boston, from 1937 to 1954. The patients, 48% of whom were males, ranged in age from 10 to 77 years, with a mean age of 24 years. The stomach and the duodenum were not involving the entire colon and occurred from 3 to areas in 25% of the patients. The colon was involved in 43%; 14 cases showed ulcerative colitis involving the entire colon and occurring from 3 to 19 weeks after the diagnosis of regional enteritis; 31% of the cases involved the cecum and ascending colon; 5% had disease in the transverse colon; another 5% had involvement of the descending colon; and 7% manifested enteritis in the sigmoid. The terminal ileum in its distal 15 to 20 cm. was involved in 55 (44%) of the patients, the remaining 56% having enteritis above this level in the terminal ileum, with one-third presenting proximal skip areas. Sixty per cent of the patients demonstrated a right lower quadrant mass, and 28% gave evidence of internal fistulas by x-ray study. The diagnosis of regional enteritis can be suspected from the clinical history, the symptom complex usually consisting of malaise, easy fatigability, chills and fever, weight loss, right lower quadrant mass, periumbilical cramps, and frequent, foul, mushy stools. A right lower quadrant mass and/or rectal abscess, fissure, or fistula with the aforementioned symptom complex point toward regional enteritis. The diagnosis can be made and confirmed by means of sigmoidoscopy, barium enema, and study of the small intestine, in that order. The over-all picture of malnutrition was discernible in approximately 50% of the cases; microcytic hypochromic anemia appeared in 51%; macrocytic hyperchromic anemia was observed in 4 cases; hypocalcemia was seen in 25%; tetany was noted in 12%; and frank avitaminosis was observed in 11% of the patients in spite of supposedly adequate vitamin intake.

In this series partial obstruction of the small intestine was the indication for operation in 93%, hemorrhage in 2%, perforation in 1%, and fistula in 4%. The mortality in 57 short-circuiting operations was 7%, and 4.5% in 86 resections. Obstruction at the site of anastomosis was revealed in 14% of 143 operations. Only one-third of the patients proved to have regional enteritis at reoperation; obstruction in the remaining two-thirds was due to scar formation. An appendix can be excised safely in regional enteritis only if the ileocecal junction and the proximal 30 cm. of terminal ileum are free of disease, as the drainage of an abscess adjacent to loops of intestine with regional enteritis frequently (24 of 30 cases in this series) leads to a fecal fistula. Intractable anorectal complications are most satisfactorily handled with a permanent sigmoid colostomy. In the follow-up period, which ranged from 2 to 26 years, the recurrence rate averaged 55%, spontaneous remissions being observed in 1.6%. Resection gave good results in 60 of 86 patients, as did excision of the terminal ileum and ascending colon in 70% when the disease process was restricted to this region, while segmental resection yielded favorable results in 50%. Short-circuiting procedures gave good results in 52% of 48 patients, and medical treatment alone provided good results in 35% of 22 patients. The most virulent forms of regional enteritis occur in the second and third decades of life, and the poorest results from all types of therapy occur in the same period. Patients free from the disease process longer than 4 years are considered to be permanently cured.

High Defects of the Atrial Septum. F. J. Lewis. J. Thoracic Surg. 36:1-11 (July) 1958 [St. Louis].

Of 66 patients operated on for atrial septal defects at the department of surgery of Northwestern University Medical School in Chicago, a high defect was observed in 7 female and 5 male patients, between the ages of 5 and 52 years. The high defect should be distinguished from the foramen ovale defect and from the persistent ostium primum defect because of its unique anatomic features. It is located just inferior to the superior vena cava. The superior edge of the atrial septum in this area is a sharp crescent which forms the inferior margin of the defect, but superiorly the defect has no definite margin, since there is no remnant of the septum above it. This defect is invariably associated with a partially anomalous, pulmonary venous drainage. In the first 2 of the 12 patients the diagnosis was made only in retrospect. In the third patient, there was a foramen ovale defect in addition to the high defect, so that the author was forced to see that the high defect was a separate lesion; since then the high defect was recognized without trouble in the remaining 9 patients.

The defect was repaired with the aid of a row of sutures placed so that the aberrant pulmonary veins were directed into the left atrium as the defect was closed. The defect was repaired through an incision in the upper part of the atrium and the lower part of the superior vena cava. There were 2 operative deaths among the 12 patients with high defects. Death resulted in a 55-year-old man from irreversible ventricular fibrillation on the operating table and was attributable to hypothermia, the technique used for these open heart operations. The second patient, a 26-year-old man, died of thrombosis of the superior vena cava, a complication peculiar to the repair of this particular type of defect. Thrombosis originating at the site of the repair may occlude the superior vena cava as well as the pulmonary veins. Such complications occurred in 4 of the 12 patients. In order to avoid these complications one can forego complete correction of the defect by leaving the abnormal connection of the right superior pulmonary vein to the superior vena cava. The patient on whom this type of operation was performed obtained an excellent clinical result, and his heart decreased in size. This operative technique is perhaps the safest method of repair at the present time. Another alternative to be explored involves anastomosis of the superior vena cava to the right atrium; this technique was used in 12 dogs, and the anastomosis was studied with angiograms in 7 animals. It remained open in 6 of these, but the follow-up was not long enough to be satisfactory.

Atypical Symptom-Sign Complex of Acute Pancreatitis. J. L. Donhauser and N. H. Bigelow. Am. J. Surg. 96:61-65 (July) 1958 [New York].

Abdominal pain, vomiting, and shock of varying degree, such as the catastrophic "pancreatic drama" described by Dieulafoy, are looked upon as typical of acute pancreatitis. However, a clinical review of cases with autopsy findings reveals that some severe attacks causing death show little of the picture given by Dieulafoy. An analysis of the clinical records of 21 patients, verified by autopsy, was undertaken by the authors to ascertain how often an accurate diagnosis was made or at least how often it reasonably could have been made. Four of the patients reviewed had no pain. Among the other patients pain was localized in the epigastrium in 4, in the right upper quadrant in 3, and in the left upper quadrant in 1; it was generalized over the abdomen in 6 and was precordial in 1. One patient was in shock, and 1 in coma. Thus, the site of pain or even its absence cannot be relied upon. Shock was present in only 3, and vomiting in only 10 of the 21 patients. Abdominal tenderness was noted in 15 of the patients. Rigidity of the abdominal muscles was present in 7 patients. Ten patients were obese, and 4 were addicted to alcohol.

The use of laboratory tests cannot be overemphasized. Hyperglycemia without glycosuria is an important sign. Although a rise in the serum amylase level may occur in various diseases, first consideration should be given to the possibility of acute pancreatitis. Pancreatitis may be mistaken for cardiovascular disease, as was the case in 8 of the patients in this series. There may be a direct relation between the pathological condition of the cardiovascular system and pancreatitis. Electrocardiographic signs of heart disease were present in 5 of the 8 patients. The serum amylase content had been ascertained in only 1 of the 8 patients in whom pancreatitis had been mistaken for cardiovascular disease. In any type of upper abdominal disorder of uncertain or obscure nature, determination of the serum amylase value should be made.

Tuberculous Fistula of the Esophagus: Two Cases Successfully Treated by Surgery. D. V. Pecora. J. Thoracic Surg. 36:53-57 (July) 1958 [St. Louis].

The author reports on a 48-year-old man and on a 26-year-old man with a tuberculous fistula of the esophagus, who were operated on at the State Tuberculosis Hospital in Ray Brook, N. Y. Both patients received antituberculous drug therapy which was undoubtedly important, since the tuberculous disease had become inactive in both patients by the time surgery was performed. Traction diverticula occurred in the upper thoracic esophagus as a result of adjacent tuberculous adenitis in both patients. The late appearance of symptoms referable to the esophagus and the presence of a traction diverticulum seemed to indicate that infection was the prinicipal causative factor for the fistula in the first patient. Pott's disease preceded the formation of the traction diverticulum in the second patient and probably was the causative factor for the diverticulum as well as the fistula.

A modified Schede thoracoplasty was performed on the first patient. The esophageal fistula was identified, but it was inaccessible in the apex of the pleural space. Attempts to free the esophagus were unsuccessful because of extensive scarring. Five days later, a Witzel jejunostomy was performed. Two months after the surgical intervention, an esophagogram with iodized oil failed to reveal an esophageal fistula. In the absence of obstruction of the esophagus, healing of the fistula occurred rapidly. In order to defunctionalize the esophagus, a Stamm gastrostomy was performed on the second patient, and 5 weeks later the cutaneous fistula was excised down to the esophageal diverticulum. The excision of the fistula was unsuccessful, probably because of poor drainage of the diverticulum as a result of partial obstruction of the esophagus below that level. Since the patient did not wish to accept a permanent gastrostomy, a total esophagoplasty by means of the intrathoracic ascending colon was performed according to Mahoney and Sherman's technique to permanently defunctionalize the esophagus. The esophagus was not severed near the cardia. At the time of his discharge from the hospital, the patient was able to take a regular diet without difficulty.

Tuberculous esophagitis and its complications will sometimes heal with antituberculous drug therapy alone. However, surgical intervention may be necessary to correct mechanical factors, in which case every effort should be made to preserve as much esophageal function as possible. Occasionally, it may be necessary to create a bypass. Under these circumstances it does not seem necessary to extirpate the diseased organ.

Ganglioneuroma of the Cervical Autonomic System. N. P. D. Smyth and V. P. Perna. A. M. A. Arch. Surg. 77:39-46 (July) 1958 [Chicago].

A 20-year-old white male patient was operated on for removal of a ganglioneuroma of the left superior cervical sympathetic ganglion. The patient was reported, on follow-up study 1 year later, as still experiencing the Horner syndrome that commenced postoperatively. This is the 32nd instance of a documented cervical ganglioneuroma. The tumor occurs with equal frequency in either sex at any age but is twice as common in children, the vagal tumor occurring only in children. Twenty-six of the 31 cases reported in the literature involved 1 or more of the sympathetic ganglions; 1, the carotid body; and 4, the ganglion nodosum of the vagus nerve. Excision is the treatment of choice to be followed by irradiation in the event of malignancy. Horner's syndrome, permanent paralysis of the vocal cord on the affected side, and transient tachycardia and dysphagia are possible sequelae.

Percutaneous Left Ventricular Puncture with Catheterization of the Aorta. H. A. Fleming, E. W. Hancock, B. B. Milstein and D. N. Ross. Thorax 13:97-102 (June) 1958 [London].

Percutaneous puncture of the left ventricle for the assessment of patients with aortic stenosis has been carried out in 115 patients, and the technique itself was extended to include catheterization of the aorta via the left ventricle. It is desirable to catheterize the aorta for 2 reasons: 1. Pressure tracings recorded continuously during the withdrawal of the catheter tip from the aorta to the left ventricle may reveal the presence of an otherwise undetectable subvalvular stenosis. 2. The systolic pressure gradient across the aortic valve is calculated more accurately from the aortic pressure pulse than from a peripheral arterial pulse. The catheter entered the aorta in 28 (78%) of the 36 cases immediately and without ventricular irritability. In 1 instance the catheter could penetrate only the subvalvular chamber, and in 2 other cases in which the aorta could not be entered autopsy revealed that the valvular orifice was tiny and situated peripherally in a great craggy mass of calcium. In 4 of the remaining 5 failures there was a significant degree of aortic regurgitation. In the present series 5 cases of subvalvular obstruction have been identified, none of which have yet come to operative confirmation. There were only 2 deaths attributable to left ventricular puncture in a total of 115 cases investigated. The classical postpericardiotomy syndrome occurred in 2 instances, which responded readily to prednisone therapy. A small number of patients suffered from severe pericardial pain at the time of the puncture, which was treated with intravenously administered pethidine and has not been accompanied by any other signs. The authors suggest that this procedure be confined to patients in whom congenital subaortic stenosis is suspected, those without calcium in the valve, and those with a history of systemic hypertension.

Clinical Observations and Concepts on Mitral Commissurotomy. Huang Minh-Hsin, Chiang Shao-Chi and Yü Kuo-Juei. Chinese M. J. 76:415-425 (May) 1958 [Peking, China].

The authors report on 231 mitral commissurotomies performed in the past 3 years. The movement of the major valve in the diaphragmatic-type valve lesion is responsible for the snappy quality of the first heart sound and for the opening snap. These 2 sounds can be abolished by pressure exerted on the major valve, although pressure exerted against the minor valve induced no such change. In tight mitral stenosis it was not unusual to find these 2 sounds well localized over the left axillary region due to hypertrophy and clockwise rotation of the right ventricle. Satisfactory therapeutic results have been observed in 105 (86%) of the 122 patients followed more than 6 months after operation. Three of the 105 patients were operated on because of a rapidly progressive cardiac decompensation within 5 months of parturition with gratifying results. Hoarseness in 1 of the 3 patients with hoarseness of voice subsided within 1 month. Two patients with tight mitral stenosis, who presented mild jaundice of dual origin (hepatocellular and obstructive) and did not respond to medical treatment, completely recovered within 10 days of the operation. No improvement could be discerned, either subjectively or objectively, in 17 patients (14%). The factors responsible for the unsatisfactory results in this series are as follows: 1. Cardiac function was only slightly improved; thus, minimal or no subjective improvement was noticed postoperatively. 2. A moderate to marked degree of mitral insufficiency occurred in 6 patients, and none of them showed appreciable benefit from operation. 3. Coexisting aortic involvement occurred in 6 patients. 4. Incomplete separation of adherent valves or mere digital dilatation of the stenotic valve afforded only temporary improvement, with subsequent recurrence of all signs and symptoms. 5. The presence of rheumatic activity either preoperatively or postoperatively gave poor operative results. The following postoperative complications were observed in a follow-up of 122 cases: auricular fibrillation, 39 (32%); paroxysmal auricular tachycardia, 3; embolization, 4; pulmonary edema, 2; postoperative neurosis, 6; gynecomastia in male patients, 10; appearance of milk secretion in females, 3; and postcommissurotomy syndrome, 29. Cardiac arrhythmias were fairly common during mitral commissurotomy. Ventricular flutter, which developed during clamping of the pericardium in 2 cases, terminated after rapid completion of valvulotomy. Chloroquine was found to be satisfactory in checking the various cardiac arrhythmias after mitral commissurotomy. No correlation was obtained between the number of Aschoff bodies in the auricular biopsy materials of 166 cases and rheumatic activity. Thrombotic changes involving the auricular appendage were present in 34%. In 10 cases of auricular fibrillation, 8 showed the presence of thrombus material.

Prognosis in Cancer of Lung. K. Winge. Danish M. Bull. 5:147-152 (May) 1958 (In English) [Copenhagen].

The material discussed is from the Central Dispensary for Tuberculosis serving the municipality of Copenhagen with its population of about 750,000. Compiled for the period from August, 1935, to December, 1955, it consists of 1,102 cases of bronchogenic cancer of the lung in 999 men and 103 women, with 70% of the patients aged from 50 to 69 years. Of the total number, 826 patients had been referred to the Central Dispensary by their physicians; 183 patients were found on group examinations among apparently healthy persons; 55, on control examinations; and 38, on mass miniature roentgenography. Of the patients in the 3 last-named groups, 100 had had symptoms, sometimes marked, for a shorter or longer time, but had remained at work with recourse to medical aid. No less than 926 (or 84%) of the patients had had symptoms prior to the demonstration of the first suspicious roentgenograms in the Central Dispensary. By far the most common symptom was cough in 89% of the patients; hemoptysis or blood-tinged sputum occurred in 24.4%; dyspnea, in 20%; pain, in 27%; and more indefinite symptoms of fatigue and loss of weight, in 41% and 26% respectively. The operability in cases with symptoms was approximately 25%, irrespective of the duration of the symptoms. Of the patients found on group examinations, 117 had been without symptoms; here 61 cases (or 52.1%) were operable. In evaluating the results, only the 982 cases diagnosed before January, 1955, are included; the shortest period of observation is thus nearly 2 years. Segmental resection, lobectomy, or pneumonectomy was performed in 270 patients (or 27.5%). The 176 patients examined from 1935 to 1944 have died. Of the 806 patients examined from 1945 to 1954, 67 survive; 62 have undergone operation, but 5 were considered to have inoperable disease. Of the 62, 5 have survived for 9 years, 3 for 8 years, 6 for 7 years, 7 for 6 years, 8 for 5 years, 8 for 4 years, 8 for 3 years, and 17 for 2 years. In the 1950-1954 period, 36.5% of the patients could be operated on radically. In 1955, recent cases of cancer of the lung were found in 120 patients; in 1956, 140 new cases were diagnosed. General practitioners are urged to send patients with catarrhal symptoms to tuberculosis dispensaries without delay and also all patients with hemoptysis, pain in the chest, and pneumonia, particularly the recurrent type of pneumonia.

Cardiomyectomy: Suggested Surgical Treatment of Cardiospasm According to Heller. W.-E. Schmidt. Chirurg 29:268-272 (June) 1958 (In German) [Berlin].

In the early forms of cardiospasm conservative methods are usually adequate. These include psychotherapy, medicinal treatment, and methods inducing local dilation. These methods prove adequate in about 80% of the cases. When conservative methods prove ineffective, surgical treatments become necessary. The author lists 17 different surgical methods that have been recommended for the treatment of cardiospasm, and suggests that Heller's cardiomyotomy is probably the most promising, particularly if it is carried out by a transthoracic approach. Operations that involve an anastomosis, that is, Sauerbruch's transthoracic and Heyrovski's abdominal esophagogastrostomies, are also valuable, particularly in the presence of esophageal dilatation not likely to regress. Most of the other surgical methods are only of historical value or are applicable only in exceptional situations. The author compared the results obtained with the aforementioned 3 methods on the basis of 841 cases collected from 38 authors. Heyrovski's method produced favorable results in 61% of the cases in which it was employed, Sauerbruch's method in 52%, and Heller's method in 86%.

Occasional failures of Heller's operation are due to inadequate description of the technique in textbooks or to the fact that the freeing of the esophagus or the myotomy was inadequate. A patient with an especially severe form of cardiospasm, with almost complete stenosis of the lower esophageal portion of the cardia, induced the author to extend Heller's operation. The patient was a 64-year-old woman. A sinistrotransthoracic exposure revealed extensive pleuropulmonary adhesions. After the mediastinal pleura had been opened, it was found that an indurated plaque, 1 cm. in thickness, surrounded the esophagus but was especially wide on the anterior side, reaching from the hiatus, a handbreadth above it, and probably continued below the hiatus. The diaphragm was slit, and in order to rule out a malignant lesion, a gastrotomy was performed. After a transverse incision had been made into the extramucosal layer of the esophagus immediately above the constriction, a plaque, measuring 12 by 2 cm., was resected down toward the hiatus, care being taken not to injure the mucosa. Four months after the operation roentgenoscopy revealed a free passage. Histological examination of the surgical specimen revealed displacement and reduction of the muscular elements, edema, round-cell infiltration, and sclerosing inflammation. The advisability of such an extensive section of the wall may be questioned, but it was necessary to free the esophagus, and the result justified it.

Clinical Patterns of Peptic Ulcer After Sixty. C. W. Cutler Jr. Surg. Gynec. & Obst. 107:23-30 (July) 1958 [Chicago].

While peptic ulcer develops most frequently in patients in the active middle years of life, a considerable number of patients seek relief from the distress of gastric and duodenal ulcers and their complications after the age of 60 years. This was exemplified by the fact that 430 of 3,049 patients with peptic ulcer whose cases were recorded at the Roosevelt Hospital in New York during the 16 years from 1940 through 1955 were hospitalized after they were 60 years old. This group included 319 men and 111 women. Duodenal ulcer existed in 286 patients, gastric ulcer in 126, marginal ulcer in 10, and both duodenal and gastric ulcers in 8. During the same period 176 patients past 60 years of age were admitted for cancer of the stomach. The incidence of malignant neoplasm was 41% higher than that of gastric ulcer. The gastric ulcers were localized on the lesser curvature in 121 patients and on the greater curvature in 5. Of the duodenal ulcers, 34 were deep, penetrating the intestinal wall, and in 6 instances they invaded other organs. The presence of arteriosclerosis was recorded in 186 (or 43%) of the patients. Relatively few ulcers developed for the first time after the age of 60, and these often manifested themselves by severe hemorrhage or by perforation sometimes without premonitory complaint. The most frequent of the late complications of ulcer creating a true emergency was hemorrhage, and in a fair proportion of cases bleeding had occurred before, perhaps periodically, over a period of years. Cases in which bleeding was the first ulcer symptom occurring after the age of 60 were likely to be particularly severe. Perforation of the stomach or duodenum was the second serious emergency in point of numbers, and it usually occured in old and chronic cases of ulcer and less frequently as the result of late-developing ulceration. Obstruction of the stomach, while a less acute emergency, still demanded active treatment. These patients had long-standing ulcer complaints. There was a larger group of patients with symptoms of many years' duration whose tolerance had been exhausted and who sought relief from the intractability of the ulcer.

Hemorrhage, especially if massive or recurrent, demanded surgical intervention. Subtotal gastrectomy was justifiable and safer than permitting continuance of bleeding, and in the great majority of such cases it was successful. In perforation of the stomach or duodenum, simple closure was the safest operation. In obstruction and intractability, unless the patient's status was favorable and there was reasonable assurance of the safety of subtotal gastrectomy in the individual case, it seemed best to be content with the employment of a less hazardous, if less ideal, procedure except when cancer was suspected. In hemorrhage, unless massive and continuing or recurrent, in obstruction of moderate degree, and in many cases of intractability—except perforation—the results of medical therapy, as distinct from surgery, were often adequate.

Results of Gastrectomy for Ulcer: Statistics of 400 Cases. A. Bonniot, J. Bonnet-Eymard and Y. Bouchet. Lyon chir. 54:343-353 (May) 1958 (In French) [Lyon].

The Hoffmeister-Finsterer gastrectomy was performed on 400 patients with gastroduodenal ulcer. The immediate results were as follows: postoperative deaths, 1.5%, and postoperative complications, 3.5%. Eleven patients died later of different causes. Follow-up of 255 patients over a period of from 2 to 11 years showed that 238 (93%) recovered completely and that 74% were free from complications of any kind. Half of the patients have recovered more than their preoperative weight, and of the other half only 10% failed to recover their preoperative weight. Ninety per cent have resumed their regular work, but 10% have had to look for an easier occupation. Pulmonary tuberculosis developed in 7 patients, but this was apparently not due to the operation, because there is often a connection between pulmonary tuberculosis and gastric ulcer for which no operation has been performed. The Hoffmeister-Finsterer gastrectomy appears to be a successful operation; the risks are very slight, and it is highly probable that the results will be good.

Late Results after Gastric Resection According to Pólya. O. Noring. Nord. med. 59:694-698 (May 15) 1958 (In Danish) [Stockholm].

From 1944 to 1953, 184 gastric resections were performed according to Pólya's method on patients with ulcers (95 of them being 50 years of age or over) at the Central Hospital in Hillerø. Fifteen patients had been operated on earlier because of a perforated ulcer, 36 had had complicating disorders before the operation, and in 13 the ulcer had undergone malignant degeneration. There were 5 postoperative deaths. Of the 166 patients with benign ulcer, 161 were followed up in 1957; 96 reported complete freedom from symptoms, 54 were improved, and 11 were not improved. Of the remaining 5 patients, 1 had died as the result of a traffic accident and 1 of coronary thrombosis; 3 were not traced. Slight or moderate dumping symptoms were present in 3.1% and recurrent ulcers in 1.2%. The investigation confirms that the prognosis is good in patients with pyloric stenosis. The author concludes that, in the face of the grave ulcer complications of hemorrhage, pyloric stenosis, and malignant transformation, there is no better treatment than the surgical, and even considerable nervous or neurotic features in the patients do not, as a rule, constitute decisive contraindications.

Arterial Aneurysms of the Internal Carotid Artery and Its Bifurcation: An Analysis of 69 Aneurysms Treated Mainly by Direct Surgical Attack. G. af Björkesten. J. Neurosurg. 15:400-410 (July) 1958 [Springfield, Ill.]

The author reports on 30 male and 35 female patients, between the ages of 11 and 68 years, with 60 aneurysms of the internal carotid artery and 9 aneurysms of the carotid bifurcation, who were admitted to the department of neurosurgery of the Finnish Red Cross Hospital in Helsinki. Two of the 65 patients had bilateral aneurysms, and 1 had 3 aneurysms on the same side. Seventeen patients were not operated on; 11 of them died, and all but 1 died of recurrent hemorrhage. Four patients were treated by ligation of the internal carotid artery. Three of them had an infraclinoid and 1 had a supraclinoid aneurysm. Two patients tolerated the operation well and did well 6 and 5 years, respectively, after the ligation; in the other 2 patients the gature had to be reopened because of hemiplegia, nd 1 of them died. In the remaining 44 patients, 46 aneurysms were attacked intracranially. Nearly all the operations were performed with the aid of intratracheal anesthesia and controlled hypotension with trimethaphan (Arfonad). Ligature of the aneurysmal stalk with linen thread or with a silver clip was performed whenever possible. There were 4 operative deaths. Of the 40 patients surviving the intracranial operation, 2 died during the follow-up period which varied between 3 months and 4½ years. Both these deaths were regarded as caused by the operation. Thus, the total mortality rate was 14%. Twenty-one patients made a complete recovery, with their work capacity fully restored. The work capacity was impaired in 10 patients, and 1 patient was totally disabled. The advantages of direct surgical attack on aneurysm of the internal carotid artery are stressed. In an addendum the author reports briefly on an additional 33 patients with aneurysms of the internal carotid artery, in 18 of whom ligature of the aneurysmal stalk was performed with thread or clip. None of the 18 patients died. Postoperative hemiparesis occurred in 1 of the 9 patients in whom the aneurysms were clipped, and hemiplagia caused by postoperative thrombosis occurred in 1 of the 9 patients in whom the aneurysms were ligated with thread.

Complications in the Surgery of Internal Carotid Artery Thrombosis. L. J. Lemmen, J. S. Davis and L. L. Radnor. J. Neurosurg. 15:438-446 (July) 1958 [Springfield, Ill.].

The authors report on 3 men and 1 woman, between the ages of 36 and 60 years, with thrombosis of the internal carotid artery as a manifestation of diffuse vascular disease, who were operated on at the Veterans Administration Hospital in Pittsburgh in an attempt to alleviate neurological symptoms which followed complete thrombosis of this vessel. Thrombectomy was performed on the first patient with bilateral thrombosis of the internal carotid artery, resulting in facial palsy and hemiplegia on the right side, but there was no retrograde flow of blood from the internal carotid artery, and the neurological findings did not change from those on admission. In the second patient with complete left central facial palsy and spastic hemiplegia on the left side, complete occlusion of the internal carotid artery was found and a thrombus, 2 cm. in size, was removed. During removal of the clot the internal carotid artery was torn, and this vessel was closed by sutures at the bifurcation. An anastomosis of the external carotid artery to the internal carotid artery was made above the site of the thrombosis. Three weeks after the operation exploration of the anastomosis disclosed a complete thrombosis of the common, internal, and external carotid arteries. Removal of a thrombus from the proximal and distal ends of the bifurcation did not result in a flow of blood. Ten months later the patient had increased spasticity in the left leg and arm. The third patient had complete motor aphasia, ptosis of the left eyelid, right-sided facial weakness, hemiparesis on the right side, and hypesthesia over the right half of the body; percutaneous angiography revealed an occlusion of the left internal carotid artery. A thrombus, 5 cm. in length, was removed from the vessel, but no retrograde blood flow was obtained, and repeated angiography on the operating table revealed a block in the artery at the base of the skull. On reexploration a thrombus was found between the previous opening in the internal carotid artery and the common carotid artery. The internal carotid artery was torn during removal of the thrombus. Left frontal osteoplastic craniotomy with the aid of hypothermia revealed a thrombus in the supraclinoid portion of the internal carotid artery. Hemiplagia and aphasia persisted, and the patient died 1 week after the surgical intervention. The fourth patient had sudden onset of aphasia, right-side facial palsy, and hemiparesis on the right side. Percutaneous angiography revealed a complete occlusion of the left internal carotid artery and partial occlusion of the external carotid artery. A thrombus, 6 cm. in length, was removed through a 1-cm. incision in the common carotid artery, 0.5 cm. below the bifurcation. Fair retrograde bleeding occurred from the external and internal carotid arteries, but an angiogram made on the operating table revealed a persistent occlusion in the internal carotid artery. An additional clot was removed from this vessel, followed by brisk bleeding from the vessel. The patient was given heparin intravenously after the first thrombus was removed. There was progressive improvement in neurological findings, and the patient's condition was maintained with warfarin (Coumadin) sodium, there being daily determinations of prothrombin time. Death occurred suddenly on the 10th postoperative day. Autopsy revealed multiple hemorrhages as a result of a vascular diathesis incident to the anticoagulant therapy.

Thrombectomy does not alter the basic pathological process of diffuse vascular disease, so that further symptoms from this disease may be anticipated. Limitations in surgical therapy were demonstrated in the first patient with bilateral thrombosis of the internal carotid artery and in the third patient with intracranial extension of the thrombosis of the cervical internal carotid artery. The advantages of thrombectomy through the common carotid artery were indicated in the fourth patient. Retrograde flow of blood from the internal carotid artery was not an index of complete removal of the thrombus, and the importance of concurrent angiography is emphasized. The hazards of anticoagulant therapy after successful thrombectomy were illustrated by the fatal hemorrhages observed at autopsy in the fourth patient.

Nephrogenic Hypertension (Goldblatt Kidney) Following Operative Trauma to the Renal Artery. R. R. McDonald, D. E. Szilagyi, and R. F. Smith. Circulation. 18:71-75 (July) 1958 [New York].

The authors report on a 59-year-old man admitted to the Henry Ford Hospital in Detroit for the evaluation of an asymptomatic aneurysm of the abdominal aorta that was verified by a translumbar aortography. During the dissection of the anterior surface of the aneurysm, approximately 2 cm. distal to the level of the left renal vein, an artery, 5 mm. in diameter, was inadvertently incised. This was immediately repaired without incident by means of 3 interrupted 5-0 arterial silk sutures. Further dissection identified this artery to be an aberrant main right renal artery. The aneurysm was then resected and replaced with a fresh aortic homograft. During the immediate as well as the later postoperative period, the patient developed malignant arterial hypertension, as well as a thrombosis of the right renal artery. The patient was cured by right nephrectomy.

The thrombosis of the right renal artery after operative injury set off a chain of events closely duplicating the arterial hypertension observed by Goldblatt after constriction or occlusion of the renal arteries in experimental animals. The resulting hypertension was severe, fulminating, prolonged, and resistant to treatment by hypotensive and ganglion-blocking agents; it was associated with pulmonary edema, myocardial infarction, and impairment of the renal function. Nephrectomy brought about a return of the blood pressure to normal levels. The concentration of renin in the removed kidney was 34 times greater than normal.

Clinical and Surgical Aspects of Pancreatic Pseudocyst: Analysis of Fifty-eight Cases. J. M. Waugh and T. E. Lynn. A. M. A. Arch. Surg. 77:47-54 (July) 1958 [Chicago].

In the authors' series of 58 cases there were 35 men and 23 women. Forty-eight of the patients were between the ages of 30 and 60 years, and 4 patients were less than 25 years old. A pancreatic pseudocyst developed in 3 of the latter after trauma to the abdomen. The 2 etiological factors more commonly associated with the development of a pseudocyst of the pancreas are inflammation and trauma. Inflammation is considered to be the forerunner of a pseudocyst more often than trauma, as 15 patients were found to have had acute or subacute pancreatitis at the time of operation, 6 other patients had a preoperative diagnosis of acute pancreatitis, and 37 patients presented histories compatible with recurrent episodes of acute pancreatitis. Twelve patients were found to have pathological conditions of the biliary tract at operation, 7 of the 12 presenting stones in the common duct. Eleven patients gave histories of excessive consumption of alcohol, and in 2 patients a perforating peptic ulcer was thought to have initiated the pancreatitis. Six patients related the onset of their symptoms to an episode of severe trauma.

In this series 31 patients had severe pain, 21 had moderate or mild pain, and 6 had no pain; 5 of these had a palpable mass in the abdomen, and 1 had jaundice. The pain, reported as being intermittent in nature with a wide variation in frequency and duration by 36 patients, was located in the epigastric region in 34 patients, in the left upper quadrant in 9, and in the right upper quadrant in 17. Only 2 patients reported having pain in the lower part of the abdomen. Pain extending straight through the body to the back was experienced by 15 patients. Vomiting was present in 9 patients, and evidence of high intestinal obstruction was the prominent symptom in 6. Of the 58 patients, 35 had a palpable mass at examination, and the presence of a mass was questioned in an additional 3. The mass, when present, was found in the upper portion of the abdomen in all cases, being located in the epigastrium in 14, in the left upper quadrant in 14, and in the right upper quadrant in 10. Jaundice of the obstructive type was present in 5 patients, and 12 of the 58 patients were found to have diabetes mellitus. Roentgenologic examination disclosed a mass in the upper part of the abdomen in 21 patients, and 9 patients had evidence of calcification in the region of the pancreas. A preoperative diagnosis of pancreatic pseudocyst was considered in 28 of the 58 cases in this series in contradistinction to the 9 preoperative diagnoses reported by Brilhart and Priestley in a study of 44 cases.

A variety of procedures has been employed in the surgical management of pseudocyst of the pancreas. In the reported series of 58 patients, incision and drainage were employed in 23 cases, incision and marsupialization in 17, complete excision in 9, internal drainage in 8, and evacuation of the cyst in 2. Total extirpation of the cyst gives excellent results but is seldom feasible because of its adherence to surrounding structures and to the pancreas itself. External drainage of the cyst is the treatment of choice in the majority of cases. Recurrence of the cyst can be prevented by drainage for a sufficient period of time. Internal drainage, although a more extensive procedure, may be the procedure of choice in selected cases.

Three Years' Experience with Peripheral Arterial Grafts of Crimped Nylon and Teflon. W. S. Edwards and C. Lyons. Surg. Gynec. & Obst. 107:62-68 (July) 1958 [Chicago].

In the department of surgery of the Medical College of Alabama, Birmingham, the first crimped nylon graft was inserted to replace an arteriovenous fistula of the common femoral artery in October, 1954. Between this date and Jan. 15, 1958, 50 additional grafts have been used in the arteries of the extremities on this service. In this series of 51 cases, replacement grafts were used in 8 arterial injuries, 1 arteriovenous fistula, 3 popliteal aneurysms, and 1 traumatic aneurysm of the axillary artery secondary to long-term use of a crutch. Restoration of blood flow was accomplished in each of these 13 cases.

Thirty-eight grafts were used as a bypass around segments of obliterative arteriosclerosis. Only those grafts with outflow into the superficial femoral, popliteal, or brachial artery were included in this study. There were 7 early graft occlusions. In the 31 patients of the arteriosclerotic group who were discharged with patent grafts, 4 grafts failed from 4 to 17 months after insertion. Three of these late failures consisted of sudden occlusions; 1 was an anastomotic leak followed by thrombosis. Forty-three of the grafts were of nylon, and in the last 7 of the bypass grafts Teflon was used. All grafts were crimped to avoid kinking. The Teflon graft is easier to handle and suture than crimped nylon and is made of the most inert synthetic fiber now known.

Experience with Shunting Procedures for Portal Hypertension. P. F. Partington. Surg. Gynec. & Obst. 107:37-46 (July) 1958 [Chicago].

Forty patients were operated on for portal hypertension between April, 1949, and June, 1957. In all but 3 patients the operation aimed at prevention of severe recurring gastrointestinal hemorrhages. The remaining 3 patients were operated on for marked splenomegaly. This was associated with hypersplenism, purpura, and ascites in 2 and no symptoms in 1. Splenorenal or portacaval shunts were performed in 27. A shunt was considered impossible or contraindicated in the remaining 13 patients. Initially acute esophageal bleeding was treated with the Sengstaken-Blakemore tube, but recurrent bleeding, coma, and death occurred in over half of the patients so treated. Three selected patients were then treated by transesophageal ligation of varices, with cessation of bleeding and no mortality.

Criteria of suitable preparation for shunting included disappearance of jaundice and most, if not all, of the ascites, a serum albumin level of 3 Gm. or more per 100 cc., a Bromsulphalein retention of not over 25%, a hemoglobin value of 10 Gm. or more per 100 cc., and no significant bleeding for a month preoperatively. Percutaneous splenoportograms and portovenograms were useful in the selection of the most suitable shunt. Portacaval shunts were performed 12 times: side-to-side in 4 patients, end-to-side in 2, and with the interposition of a segment of superficial femoral vein in 6. Splenorenal shunts end-to-side were performed 15 times. There were 2 operative deaths. Seven additional patients died in from 10 to 60 months, none of recurrent bleeding. All but the last 3 patients operated on were followed up for between 1 and 6 years. Of the 4 patients who bled postoperatively, 2 had vein grafts, 1 had a splenorenal shunt for schistosomiasis, and 1 bled after splenorenal anastomosis until resection of a benign gastric ulcer.

Determination of Portal Pressure by Means of Catheterization of the Hepatic Vein and by Direct Puncture During Operation. E. S. Bücherl, J. Koncz and R. Bücherl. Chirurg 29:241-245 (June) 1958 (In German) [Berlin].

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The authors refer to a report by Myers and Taylor, who in 1951 demonstrated that by introducing a catheter through the vena cava and into a hepatic vein until the latter was completely occluded they were able to ascertain the portal venous pressure. The authors used this method in 32 patients. The catheter was introduced through the right atrium and the inferior vena cava. The first object of these studies was to ascertain to what extent the pressure values that are registered in the presence of an occluded hepatic vein correspond with the actual pressure in the portal vein. "Normal values" in the blocked and (by retraction of the catheter) "deblocked" hepatic vein as well as in the inferior vena cava were ascertained in 7 patients without hepatic disorders. The values ascertained corresponded with those determined in the literature.

In patients with hypertension of the portal vein, the authors obtained somewhat higher values than had been ascertained by other investigators. The authors feel that their selection of patients was to a certain extent responsible for these differences. In 15 patients with intrahepatic portal vein hypertension, it was possible to compare the preoperatively obtained pressure values in the blocked hepatic vein with the direct measurements obtained in the portal vein during operation. The latter were generally somewhat lower than were those obtained by catheterization of the hepatic vein. The authors feel that, despite these slight differences, the catheterization of the hepatic vein can be regarded as a method that provides reliable information about the pressure in the portal vein.

Dislocation of the Atlas on the Axis: The Value of Early Fusion of C1, C2 and C3. E. Alexander Jr., H. F. Forsyth, C. H. Davis Jr., and B. S. Nashold Jr. J. Neurosurg. 15:353-371 (July) 1958 [Springfield, Ill.].

The authors report on 25 patients, between the ages of 21 months and 75 years, with fractures of the odontoid process of the axis. There were 22 men, 2 women, and 1 infant. The fractures were the direct result of motor-vehicle accidents in 16 patients. Falls from a height were the cause of the fractures in 5 patients. One patient was thrown against a building by a cow. One fracture was the result of metastasis of a carcinoma of the prostate to the body of the axis. The 21-month-old infant had either trauma to the neck at birth or an infection about the neck. One patient sustained a spontaneous fracture in association with severe rheumatoid arthritis. A decompressive laminectomy was performed on the infant. Fusion of the occiput to the 3rd cervical vertebra was performed on the patient with metastatic carcinoma. Two patients were treated by surgical fusion between the axis and the atlas only. Fusion of C-1, C-2, and C-3 was performed on 12 patients. Seven patients were treated by traction, followed by further rigid immobilization for varying lengths of time. Two patients did not receive specific treatment (immobilization, traction, or surgery) for their fractures of the odontoid process.

The infant died within 24 hours, and the man with metastatic carcinoma of the prostate died within 14 days after the operation; 3 patients treated by traction died within 13 days to 9 months after injury. Fractures of the odontoid process are associated with dislocations of the atlas on the axis and carry a high mortality if associated with acute injury to the cervical spinal cord. The immediate mortality is low if there is no severe injury to the cervical spinal cord, i. e., if the patient reaches the hospital in satisfactory neurological condition. With prolonged immobilization of the head and neck, some fractures of the odontoid process undergo solid healing apparently, but the period of disability is lengthened. Late neurological complications, with occasional death up to 30 years after unsatisfactory healing of a fractured odontoid process, have been reported frequently in the past and are serious enough to warrant operative fusion to prevent future dislocation of the atlas on the axis.

Of the 15 patients on whom operative fusion was performed, only 1 (the patient with metastatic carcinoma of the prostate) died, death resulting from a pulmonary embolus. The operative method of fusion of C-1, C-2, and C-3, with the iliac bone for grafting and, more recently, ribs from a bone bank, proved satisfactory in the 12 patients in whom it was employed. It was performed from 8 days to 3 months after injury, and the patients were followed for periods ranging from 3 months to more than 6 years. Experience gained from this relatively large group of surgically treated patients leads to the conclusion that early surgical fusion in a patient with fracture of the odontoid process protects the patient from the late sequelae of atlantoaxial dislocation. Fusion can be done with much shorter hospitalization and earlier return to useful employment than with prolonged traction and immobilization which do not assure solid healing of the fractured odontoid process.

Principles in the Surgical Management of Mass Casualties. H. H. Ziperman. A. M. A. Arch. Surg. 78:1-9 (July) 1958 [Chicago].

The medical management of large numbers of sick or injured, whether they result from epidemic disease, combat, or disaster, involves the establishment of an organization that takes into consideration every essential of proper care. This orderly process of medical management insures that, wherever possible, each patient will receive treatment in proportion to his degree of morbidity and disability, and under no circumstances will the lives of the many be jeopardized by the medical needs of the one or the few. The initial management of the injured en masse is a surgical problem entailing the sorting of casualties to determine priority for treatment, evacuation, and return to duty; it entails the emergency treatment of those wounded in order to save life and limb; it entails the surgical treatment of those injured requiring operation; and it entails the postoperative management of those casualties submitted to surgery. Sorting is the procedure by means of which the sick and wounded are classified according to type and urgency of conditions presented, so that they can be properly routed to the medical installation appropriately equipped and situated for their care. It is a continuous procedure throughout the treatment chain and must be practiced in each installation by the most mature surgeon available. It is a flexible procedure which not only takes into consideration the over-all disaster or tactical situation but also considers changes in local medical capabilities which may alter the criteria for return to duty and the priorities for evacuation and treatment. Since the priority for treatment in years past has always been based on an unfailing source of supplies for treatment and little or no disproportion between numbers of casualties and quantity and quality of medical personnel available for treatment, the most severely wounded have enjoyed the highest and the least severely wounded the lowest priority. Prior planning for the care of mass casualties due to atomic disasters requires some modification of this priority system in order to avoid disservice to the many in favor of the few because of limited treatment facilities, inadequate supplies, and lack of medical personnel. Such a modification provides for the division of all the injured into 4 groups: (1) casualties requiring minimal treatment; (2) casualties requiring immediate care; (3) casualties whose surgical treatment may be delayed without immediate jeopardy to life; and (4) casualties whose therapy will be expectant. The treatment of casualties may be divided into (*a*) first-aid and rescue, (*b*) emergency medical treatment, and (*c*) definitive surgical treatment. All treatment is to be modified by short cuts and compromises to permit caring for the larger number of casualties per unit of time.

Improvements Made in the Results of Surgical Treatment of Hypophyseal Adenomas and Craniopharyngiomas by Preoperative and Postoperative Adrenocortical Hormone Therapy. J. Decourt, D. Petit-Dutaillis, J.-P. Michard, and E. Bernard-Weil. Presse méd. 66:971-974 (May 31) 1958 (In French) [Paris].

The increasing boldness of neurosurgeons in attacking hypophyseal adenomas and craniopharyngiomas has resulted in a higher operative mortality. Advances in surgical technique and the availability of endocrine replacement therapy justify the more radical operations now performed, but the immediate dangers of preoperative and postoperative glandular insufficiency are not always given adequate consideration. Some patients are already in a state of hypophyseal and adrenal insufficiency when they come to operation, and all are more or less so after the operation. This circumstance, more than any other, is responsible for the more or less serious reduction in the resistance of these patients to aggression. It is therefore of the utmost importance to evaluate the extent of the endocrine deficiency by thorough preoperative clinical tests and an exhaustive investigation of adrenocortical function, so that the necessary corrections can be made before and after the operation.

Data obtained from the study of 12 patients who were thoroughly explored from the endocrinological point of view and of 7 others in whom the urgency of the need for operation necessitated less complete investigation showed that a certain amount of adrenal insufficiency is the rule in tumors of the hypophyseal region. The adrenal insufficiency is clinically evident in the major syndrome of hypophyseal insufficiency, which may lead to coma quite apart from surgical trauma, and exploration merely confirms the fact. Biological exploration, however, is needed to establish the lesser degrees of insufficiency present in ambulatory patients in whom the major signs are ocular or gonadal. Adrenocortical insufficiency is apparently an important element in the fragility of these patients when they are subjected to stress of any kind, whether accidental, as in the case of infectious disease; medicamentous, as in sensitivity to alkaloids or mercurial diuretics; or, even more, surgical. Precise information on the functioning of the adrenal glands can at present be obtained only by assaying the steroids that are metabolites of the adrenal hormones. Elimination of the 17-ketosteroids, which was measured in the 12 patients who were thoroughly studied, was low in 7 and normal in 2 of those with chromophobe adenomas; in the other 3, all of whom had craniopharyngiomas, it was greatly reduced, even though 1 was leading a normal life and complained only of a few visual disturbances. Corticoid elimination was reduced in 10 patients—7 with chromophobe adenomas and the 3 with craniopharyngiomas. Some of the patients with low corticoid excretion were leading normal social and professional lives in spite of the asthenia from which they suffered. This lack of parallelism between the clinical signs of adrenal insufficiency and the elimination of the steroids emphasizes the need for biological exploration which alone permits accurate measurement of the adrenocortical deficit and so provides exact indications for hormone therapy.

The authors' patients were given intramuscular injections of cortisone according to the following schedule: 50 mg. in the morning and in the evening of the day before the operation; 100 mg. on the morning of the operation; and then 50 mg. every 12 hours for the next 48 hours. The doses were reduced to 25 mg. every 12 hours beginning with the third day, and after the first week one injection of 25 mg., easily replaced by 2 tablets of hydrocortisone, each containing 10 mg., was given daily until the patient left the service. The doses were increased to 150 mg. daily, given in 3 injections, for the first few days in cases of severe hypopituitarism, especially in patients with craniopharyngiomas. All the patients were also given injections of desoxycorticosterone in doses of 10 mg. on the morning of the operation and 5 mg. on the next day. Significant complications (an epileptic episode followed by unconsciousness on the day after the operation, and a secondary infection controlled by antibiotics) were encountered in only 1 patient on whom the operation was difficult. The postoperative period was uneventful in the other 11 patients; no disturbances of consciousness or respiration were observed, and all the patients were able to leave the service between 10 and 15 days after operation. The excellent results obtained in this small series indicate the value of preoperative and postoperative hormone therapy as a means of lessening danger and preventing complications in the surgical treatment of hypophyseal adenomas and craniopharyngiomas.

The Operative Treatment of Hirschsprung's Disease. J. A. Noordijk. Arch. chir. neerl. 10:88-97 (No. 1) 1958 (In English) [Arnhem, Netherlands].

In Hirschsprung's disease or congenital megacolon, microscopic examination reveals normal autonomous ganglions in the distended parts and an absence of these cells in the seemingly normal sigmoid and rectum. Swenson and co-workers suggested that surgical therapy be directed against the outwardly normal-looking parts and not against the distended colon. This reasoning proved a success. Not all children with a distended colon have Hirschsprung's disease, and this makes it necessary to have a careful check-up before operating. Megacolon may occur secondary to organic obstruction, such as anal stenosis, tumor, and neurological disorders, for instance, spina bifida. Another type of megacolon is due to "colonic inertia"; a third type is caused by segmental aplasia of autonomous ganglions (Hirschsprung's disease).

The author is concerned with this last type of megacolon. He treated 11 patients, performing Swenson's operation on 9 of them. Seven of these survived without complications and are well. A rectovaginal fistula developed in 1 patient, and 1 patient died during the operation. A partial colectomy was performed on 2 adult patients, the sigmoid being removed but only the upper part of the rectum. One of these patients has had regular stools for 3 years and has no complaints. The other patient has periods in which laxatives are necessary. Only 2 of the 11 patients were women. The author recommends Swenson's type of operation. He emphasizes that the transitional zone may reach into the hypertrophic part, especially in older children. It is, therefore, necessary to make frozen sections of the intestinal wall during the operation in order to determine where the normal ganglions begin.

NEUROLOGY & PSYCHIATRY

One Thousand Cases of Late Onset Epilepsy. S. Sheehan. Irish J. M. Sc. 6:261-272 (June) 1958 [Dublin].

All the patients in this series of 1,000 patients, comprising 632 males and 368 females, who experienced their first attack of unconsciousness at or after the age of 20 years, have been followed up for periods varying from 6 months to 10 years. Sixty of the patients when first seen had had only 1 epileptic attack; the remaining 940 had had 2 or more attacks. The age range for the entire group extended from 20 to 76 years. In 24 of these patients a history of epileptiform disturbance in some member of the family was elicited. An air encephalogram or a cerebral arteriogram or both were obtained in 950 patients.

Of the patients studied, all those with rapidly growing and highly anaplastic cerebral gliomas were dead within 6 to 15 months of their first seizure. Excluding those who died of primary or secondary neoplastic processes, 11 patients died as a result of coronary thrombosis, 1 was a suicide, and 2 died in nonconnected accidents. Seventeen patients whose clinical state was that of presenile dementia died within 5 years of hospital admittance for investigation of seizures. There were 106 patients (10.6%) with primary cerebral tumor in this series, 74 of whom were male. Primary bronchogenic carcinoma with metastatic spread accounted for 24 of the 33 patients who had seizures due to metastases. The patients in the cerebral arteriosclerotic and hypertension group numbered 71, and those in the carotid thrombosis and stenosis group totaled 15. The cases of 3 patients, all male and in their early 50's, with middle cerebral artery thrombosis were confirmed angiographically. The association of migraine and epilepsy was noted in 109 patients; many in this group had had migraine headaches for years before they had an attack of unconsciousness. The number of patients in the post-traumatic group reached 73, 60% of their attacks having commenced within 6 to 9 months after injury, which was most commonly a closed head injury. The neurosyphilis component was comprised of 17 males and 10 females, all of whom had acquired syphilis and were in the secondary and tertiary stages of the disease with the exception of 3 with congenital syphilis. Disseminated sclerosis was seen in 25 patients in association with fits. Three patients with congenital hemiplegia, which included 2 instances of agenesis of the corpus callosum and 1 of toxoplasmosis, developed focal seizures in their 20's, and 2 had abnormal air encephalograms showing porencephaly and ventricular dilatation on the side of the brain affected. One of the 5 alcoholics had hypertension, arteriosclerosis, and Korsakoff's psychosis; 2 others had a Wernicke type of encephalopathy from which they made a good recovery. There were 3 patients with brain abscesses, 2 secondary to chest infection and 1 to mastoid infection.

Five patients, ranging in age from 20 to 35 years, experienced their first epileptic attacks during their first pregnancies, 4 other patients having had their attacks during their second and third pregnancies. In no case was there any evidence of albuminuria or hypertension or other factors that could be attributed to toxemia of pregnancy. Other etiological factors that accounted for the attacks were as follows: diabetes mellitus, 2; hyperinsulinism, 1; subdural hematoma, 2; idiopathic hypoparathyroidism, 1; subacute bacterial endocarditis, 3; sarcoidosis, 1; leukemia, 2; internal hydrocephalus, 3; pernicious anemia, 1; excessive beer consumption, 3; and superimposed chest infection, 5. An etiological factor has been established in 552 cases (55%), and of these primary and secondary tumors constituted 139 (25%).

The last group (idiopathic epilepsy) was composed of the remaining 440 patients (44%) in whom no specific etiological factor had been demonstrated at the time of investigation. In this group 50 patients, none of whom had less than 3 verified grand mal attacks, had discontinued treatment of their own accord without any recurrence of their attacks. The most common medicament employed in this group was phenytoin sodium and/or phenobarbitone. Primidone (Mysoline) has been used to some extent, but the incidence of toxic effects and intolerance has proved to be high. A new glutonamide derivative known as Preparation 16038, which is the 9-(*p*-aminophenyl)-α-ethyl glutonamide, has been on trial either on its own or with other anticonvulsants. The preparation, which has been shown to be helpful in patients in whom no other combination of treatment had been effective thus far, appears to be relatively nontoxic, and no blood dyscrasias have been noted as a result of its use.

Myasthenia Gravis After Removal of Cystic Thymus: Study of Electrolytes During Myasthenic Crisis. E. Fongi, D. Gotlieb, C. A. Vaamonde and others. Prensa méd. argent. 44:3754-3760 (Dec. 27) 1957 (In Spanish) [Buenos Aires].

A thymectomy on patients with myasthenia gravis results in great improvement of symptoms. The development of myasthenia gravis of a rapidly fatal course after removal of an aberrant thymus has not been previously reported. A woman, 22 years old, complained of anorexia, loss of weight, constant midsternal pain, and cough. These symptoms had lasted a year. On hospitalization the patient appeared normal, except for loss of weight. There were no signs of myasthenia gravis. Roentgenologic examination of the chest revealed a mediastinal shadow. At operation a cyst was removed, which on histological study proved to be an aberrant cystic thymus. The patient reported 4 years after the operation, complaining of difficulty in mastication, deglutition, respiration, and walking. Her face and general appearance were those of one with myasthenia gravis. Several acute crises occurred, with the patient hospitalized. These were controlled by intramuscular administration of Prostigmin in doses of 0.25 mg. at intervals of 8 hours and later by intramuscular administration of Pyridostigmine in doses of 1 mg. at intervals of 4 hours. Improvement of the patient permitted another operation to be performed, during which an enlarged thymus was found and was removed. Histologically it proved to be a hyperplastic persistent thymus. The patient died in an acute respiratory crisis 36 hours after the operation. In the course of the crisis a study of the electrolytes was carried out. The potassium in the blood plasma was normal. This study showed that the good results of potassium therapy in myasthenia gravis are due to the decurarizing effect of potassium on neuromuscular impulses, rather than to a correction of a special disturbance of potassium in myasthenia gravis, which does not exist.

Electroencephalographic Abnormalities in Hepatic Insufficiency and in Coma. J. Bogacz, M. Arcos Pérez and E. García Austt. Acta neurol. latinoam. 3:364-373 (No. 4) 1957 (In English) [Buenos Aires].

Hepatic insufficiency in primary diseases of the liver produces in all cases severe neurological and neuropsychiatric disorders, the most serious of which are the disturbances of consciousness which progress into hepatic coma. Thirty-three patients with insufficiency of the liver were observed on the neurological ward of the Hospital of the Faculty of Medicine of Montevideo. Twenty-eight patients had cirrhosis of the liver, 3 had viral hepatitis, and 2 had extrahepatic obstructive jaundice. The patients had been treated with cortisone, corticotropin, antibiotics, and some of them with glutamic acid. Tests for liver function were made, and electroencephalograms were taken. The patients were placed in 4 groups according to the stage of the disturbances of consciousness: (1) alert patients; (2) clouded state of mind; (3) superficial coma (restless period); and (4) deep coma. Fourteen patients were in the second stage, 6 of these patients passed into coma (third or fourth stage), and 3 patients were in deep coma immediately after hospitalization (fourth stage). Humoral tests showed dysfunction of the liver in all cases, but the results of the tests did not change when the disturbances of consciousness became more severe. The electroencephalograms, on the contrary, showed a progressive depression of the cerebral electrogenesis, paralleling the intensification of the disturbances of consciousness. An electroencephalographic pattern characteristic of only superficial hepatic coma progressing into deep coma was found. It registers at the end of the third stage and the beginning of the fourth stage. It consists of delta polyrhythmic waves and bilateral synchronous complexes of slow spike-waves which are predominantly in the frontal region. The pattern persists all through the period of coma. In deep coma it disappears and is substituted by bilateral biphasic or polyphasic waves which are followed by the flat record of electrical silence. The flat record is not an indication of immediate death of the patient. When it lasts more than 24 hours, the patient develops unilateral or generalized epileptic seizures before death. The results of electroencephalographic studies showed that cortisone and corticotropin do not modify the electroencephalographic records. The authors conclude that hepatic coma is an authentic electroclinical syndrome in which the progressive humoral and organic changes caused by insufficiency of the liver and the reaction of the nervous system to the changes are the causal factors.

Treatment of Acute Barbituric Acid Poisoning: Ten Years' Experience at Center for Treatment of Poisoning in Copenhagen. S. Louw. Danish M. Bull. 5:137-143 (May) 1958 (In English) [Copenhagen].

Since late 1949 all patients with severe cases of barbiturate poisoning have been admitted to a special section of the psychiatric clinic of Bispebjerg Hospital, Copenhagen. The number of admissions has been about 900 annually. Treatment is supervised by psychiatrists from the clinic assisted by 3 trained nurses working on 3-shift duty. The main object of the treatment is to combat manifest and latent conditions of shock and establish physiological conditions. As fluids for infusion blood, Macrodex (a blood plasma substitute) and dry serum are used in quantities depending on the severity of the shock. Rapid intervention in various complications is of decisive importance. Since 1955 a physiological stimulant, arterenol, has been employed. If the state of shock remains uninfluenced after the first liter of intravenous infusion, arterenol is added to the infusion in doses of 4 to 12 mg. per 500 ml. of fluid. From 1946 to 1951 the mortality fell from over 24% to about 2% in Copenhagen and to an average of 3.7% for the entire country; in 1955 the total lethality for the country was 2.3%. The antidote for barbituric acid, synthesized by Shaw and co-workers, is called Megimide (Glutamisol). Until April, 1956, 7 patients with complete apnea due to poisoning with barbituric acid were treated with Megimide (partly with Amfisol), and the paresis was relieved in all cases. Tests with Megimide, continued in 1956 and 1957, confirmed the results of the first test period. Megimide has a stimulating effect on reflex activity and particularly on respiration and may thus be a valuable preparation in severe intoxication. As a stimulant it has the advantage over central analeptics previously used in that it does not cause overloading of the heart by increase in blood pressure or hyperpyrexia. The main method of treatment of acute barbituric acid poisoning continues to be the combating of circulatory shock by the infusion of fluids. Megimide will be of use in special cases, notably those complicated by respiratory paresis.

GYNECOLOGY & OBSTETRICS

Cytologic-Colposcopic Observations of the Ectocervix of Pregnancy. W. R. Lang, A. E. Rakoff and G. Tatarian. Surg. Gynec. & Obst. 107:31-36 (July) 1958 [Chicago].

The authors made studies on 300 pregnant women, evaluating the portio vaginalis of the cervix by cytological, colposcopic, and biopsy methods. One hundred ninety-eight women were examined during various stages of normal pregnancy; 81 other women were examined in the immediate postpartum period (median time after delivery, 40 hours), and 21 were studied just before or after a spontaneous abortion. The median age of all patients was 27 years. Cytological specimens were obtained both by vaginal aspiration of the posterior fornix and by cervical scraping. The smears were fixed in equal parts of 95% alcohol and ether and then stained by the method of Papanicolaou. During pregnancy the succulence of the cervix and the increased cellular desquamation tend to provide numerous cells for study. Colposcopy was done with an instrument that provided stereoscopic inspection of a well-illuminated cervix at a magnification of 10 times. Three per cent aqueous acetic acid is applied to the portio to increase detail. Aqueous iodine solution in the form of strong iodine solution (U.S.P.) (Lugol's solution) is applied as a surface vital stain to detect iodine-nonstaining areas (Schiller's test).

The major effect of pregnancy on the cervix is that the squamous epithelium may proliferate to such a degree that the surface seems wrinkled colposcopically; it may even become papillomatous. The authors observed 4 such patients, all with normal cytological smears. Ten patients had grossly visible polyps; tiny polypoid structures were frequently noted colposcopically. Squamous covering (epidermidalization) of a polyp may also be recognized by colposcopy. Epidermidalization of cervical polypi may be associated with benign atypias in the smear. The general vaginal cytological picture of normal pregnancy is briefly described. The colposcopic picture of a cervical erosion is the same in pregnant as in nonpregnant women. The cervix during the postabortal period resembles the cervix during pregnancy, except that it is dilated and shows evidences of trauma, such as laceration, true erosion, and ecchymosis. After delivery the cervix contracts rapidly, so that by 48 hours the os is nearly normal in size. Noncancerous colposcopic atypias were noted in 22 instances. Biopsy was performed on all except 2 of these patients. The findings were: simple leukoplakia, 7 times; mosaic leukoplakia (whitening with a mosaic pattern), 6 times; inflamed transformation zone, 4 times; ground leukoplakia (whitening with a stippling of red spots), 3 times; and true erosion, 2 times. Carcinoma in situ was discovered in 1 woman, in whom the Papanicolaou smear and colposcopy remained negative during pregnancy. Invasive carcinoma was discovered in 2 women, aged 37 and 23 years respectively. Gross inspection of the cervix during the pregnant state, even more so than during the nonpregnant state, affords only a rough estimate of the true nature of the cervical changes seen. Cytological studies are valuable in the routine screening of the pregnant cervix. Colposcopy is of value in further studying those patients in whom gross changes are noted by speculum examination or those who have an abnormal smear. Colposcopy does not lend itself to a routine screening program. Both cytology and colposcopy provide diverse, yet complementary data concerning the uterine cervix of pregnancy.

Mesonephric Carcinomas of the Ovary. S. Kay and R. H. Hoge. Surg. Gynec. & Obst. 107:84-94 (July) 1958 [Chicago].

Since Schiller's original paper on mesonephroma of the ovary, considerable controversy has arisen concerning this tumor. The authors feel that the attitude of uncertainty about mesonephric tumors of the ovary is all the more surprising, since neoplasms of mesonephric origin appear to be readily accepted in other portions of the female genital tract, where Gärtner's duct may embryologically be sought. During the last 7 years, the authors had the opportunity to study 9 malignant ovarian tumors believed to be of mesonephric origin. The histories of these 9 patients are presented. From the gross appearance of the ovarian tumors there was nothing especially characteristic that would permit a diagnosis prior to miscroscopic study. The tumors were generally cystic with solid areas. Papillary structures were a feature in some neoplasms. A few of the growths showed a mucoid substance exuding from the cut surface. These tumors are characterized by tubular structures which often resemble wolffian duct tubules. Branching dichotomous tubules may prove to be a prominent feature. The tumor cells frequently show clear cytoplasm which in many instances stains positively for fat, mucin, and glycogen. An exaggeration of the cytoplasmic vacuolation leads to a picture of hypernephroid carcinoma which resembles those clear-cell carcinomas commonly found in the kidney. When vacuolation is extreme, lipid material appears to be the principal component in the cells. These neoplasms are malignant and, when they arise in the ovary, presage a grave prognosis, should capsular invasion and adherence to adjacent structures be present.

Vaginitis and Neonatal Infection: Etiology of the Mycoses of the Newborn. J. Bret and C. Coupe. Presse méd. 66:937-938 (May 24) 1958 (In French) [Paris].

Bacteriological studies of 300 consecutive mothers and their newborn infants showed that in most cases neonatal mycotic infections can be traced to vaginal mycosis in the mother. Specimens were taken from the first 200 mothers at the time of delivery, and from the last 100 both at the time of delivery and on admission to the service, as a means of determining the incidence, if any, of infection contracted in the hospital. The specimens obtained from the first 200 infants were taken at birth and 6 hours later from the oral cavity and the nasal fossae, and again 24 hours and 4 days after birth from the oral cavity, the nasal fossae, the stools, and the urine. The 24-hour and 4-day studies were repeated in the last 100 infants when they were ready to leave the service, 10 to 25 days after birth.

The percentages of positive cultures obtained in the newborn infants in these two groups were practically the same—16 and 17%. Candida albicans was not found immediately after birth in the oral cavities or nasal fossae of any of the infants born of mothers free from vaginal mycosis. Infants in whom C. albicans was present in the oral cavities or nasal fossae immediately after birth, on the other hand, were born of mothers carrying the same infection. Hospital contamination was apparently responsible for the infection in 2 infants in whom C. albicans was present at the time of discharge, although they were free from infection at birth and were born of mothers who were not infected.

The need for thorough bacteriological studies and treatment of vaginitis during pregnancy, if neonatal infection is to be prevented, is shown by the discovery of C. albicans in the vagina in 20% of the women at the time of delivery. The infection was transmitted to the infants during delivery by

83% of these women; in the other 17%, whose infants did not contract the infection, delivery was rapid (2 or 3 hours), with a short expulsive period and late rupture of the membranes. Postnatal pathological manifestations of mycosis are much less common in newborn ~~infants than might be~~ expected from the frequency with which C. albicans is found in their oral cavities immediately after birth. The mycotic organisms generally disappear spontaneously for some unknown reason a few days after the birth of the infant. Only 7 (40%) of the 17 infants in the second group in whom C. albicans was found at birth still harbored the infection 10 days later. The transient appearance of C. albicans in the urine of infants with no associated signs of mycosis does not necessarily indicate a pathological condition, but seems rather to show that the urinary tract is a pathway by which the organisms are eliminated.

A Clinical Trial of Intravenous Apresoline in the Management of Toxaemia of Late Pregnancy. G. T. Johnson and R. B. Thompson. J. Obst. & Gynaec. Brit. Emp. 65:360-366 (June) 1958 [London].

The authors describe their experiences with hydrazinophthalazine (Apresoline) given intravenously to 25 patients in the third trimester of pregnancy. The patients studied had toxemia in the latter weeks of pregnancy; the average duration of pregnancy was 36 weeks, with a range of 30 to 43 weeks. The ages of the patients ranged between 20 and 42 years. On admission to the hospital all remained at rest in bed throughout the study. The sodium intake was restricted to less than 1 Gm. per day, and the intake of fluid was reduced to approximately 1 to 1.5 liters per day. In 7 patients the preeclampsia was superimposed on a preexisting hypertension. In some of these the blood pressure had been elevated before the 20th week of pregnancy, and in some it was known to have existed before the onset of pregnancy.

In nearly all the patients the administration of Apresoline was preceded by a period of observation during which traditional methods of treatment were employed. Apresoline was given by intravenous injection in an initial dose of 20 mg. dissolved in 1 ml. This produced in most cases a steady fall in blood pressure, beginning a few minutes after administration and reaching a maximum in 1 to 1½ hours. The effect was maintained for 3 or 4 hours, after which a steady rise occurred, which on rare occasions reached the original level in 8 to 12 hours. In these patients treatment had to be repeated at intervals of from 6 to 12 hours. In only 3 cases were more than 3 injections given, as the need for Apresoline therapy usually arose in patients with severe preeclampsia in whom there was an indication for early induction of labor as soon as the patient's condition permitted. The authors found that intravenously administered Apresoline is capable of reducing the level of preeclamptic hypertension when it arises in the latter weeks of pregnancy, its hypotensive effect being unimpeded by preexisting essential hypertension. The drug produced normotensive levels in most patients, often when other traditional techniques had failed. The drug was most useful before surgical induction of labor, but the authors emphasize its possible danger if combined with general anesthesia. Side-effects of Apresoline were not prominent, and its hypotensive effect was superior to orthodox methods of sedation in both complicated and uncomplicated preeclampsia. A more extensive trial with short-term Apresoline treatment is justified.

Vagitus Uterinus—The Cry in the Uterus. A. Iklé. Schweiz. med. Wchnschr. 88:600-601 (June 14) 1958 (In German) [Basel, Switzerland].

A 24-year-old primipara went into labor at term. Uterine contractions developed spontaneously, and in the course of 8 hours the uterine os was dilated to the size of the palm of the hand. After that there was no further progress. In order to counteract this state the bag of waters was ruptured, and an infusion of dextrose was given. Three hours later the cervix was completely dilated, and the head of the child had reached the interspinal line when there was another arrest in the delivery. There was evidence that the pelvis was somewhat small and that the sacral concavity was somewhat flat ("lower forward sacrum"), but since the child was not large and the head could be compressed, it seemed that vaginal delivery could be expected. The Kielland forceps were to be employed, but since they could not be placed properly, it was decided to use forceps with smaller blades. While the nurse handed the instrument to the obstetrician, the infant was heard to cry, making a sound like that of a child crying under a pillow. The infant was extracted by forceps; it was not asphyctic and cried at once. There was no increased nasopharyngeal or tracheal secretion.

The author comments on vagitus uterinus and cites earlier reports on this phenomenon. It has been suggested that the following requirements must be fulfilled for this condition: 1. The bag of waters must have been ruptured. 2. Air must have entered the uterus. 3. The infantile respiratory center must have been stimulated by a strong asphyxia or pain stimulus. The entrance of air into the amniotic cavity is possible only when much of the amniotic fluid has run off and the uterus has a vacuum that can draw in external air through the vagina. This situation exists in the course of manual tration of indirect bilirubin in the serum. All the 85 infants studied were part of a larger group study carried out by Silverman and others to test the relative effectiveness of 2 prophylactic antibacterial regimens on newborn premature infants. Kernicterus, as proved by postmortem examination, occurred in all weight groups with no relation to the fatality rate from all causes in each weight group. All the 14 surviving infants had concentrations of direct (van den Bergh) bilirubin in the plasma of less than 2 mg. per 100 cc. and peak total bilirubin concentrations of more than 15 mg. per 100 cc. at any time during the study. Only 1 of the 9 infants proved to have kernicterus at time of autopsy was found to have developed a concentration of bilirubin higher than 20 mg. per 100 cc. of plasma, and in the majority the peak value was less than 15 mg. per 100 cc. All the latter group presented at some time prior to death a clinical picture compatible with kernicterus, which included 1 or more of the following neurological signs: opisthotonos, spasticity, a "sunset" sign, poor feeding, and, terminally, a bloody discharge from the nose or mouth. A review of the patients disclosed to have had kernicterus at postmortem examination revealed that 11 of the cases had occurred in the penicillin-Gantrisin prophylaxis group of Silverman and associates. Upon completion of his studies Silverman substantiated the hypothesis that the penicillin-Gantrisin prophylactic regimen promoted the development of kernicterus in small premature infants. It was later established that, while a patient is slowly dying, the concentration of bilirubin in the plasma diminishes. In 20 infants in the penicillin-Gantrisin group, the average peak value of plasma bilirubin was 8.0 mg. per 100 cc. (S.D.±3.9) and occurred on the 3rd day of life, while in 30 infants who were given Terramycin the average peak value was 16.4 mg. per 100 cc. (S.D.±7.2) and occurred on the 4th day of life. The difference is significant and suggests that the antibiotic agents may have had a direct effect on the production, distribution, or elimination of bilirubin in the premature infants.

Chemical and Clinical Observations During Treatment of Children with Phenylketonuria. H. K. Berry, B. S. Sutherland, G. M. Guest and B. Umbarger. Pediatrics 21:929-940 (June) 1958 [Springfield, Ill.].

Three children with phenylketonuria, between the ages of 2½ and 4½ years, have been treated with 3 different diets with low-phenylalanine content during the past 18 months. An attempt was made to evaluate each child by physical examination, electroencephalographic examination, psychometric studies, roentgenographic skeletal examination, and chemical analyses of the blood at periodic intervals. Analyses of serum were made at regular intervals by means of a paper chromatographic method described by Berry. While no dramatic improvement in mental ability was observed in these children, all 3 demonstrated improved motor ability, better balance, greater dexterity, increased awareness, lengthened attention span, and decreased tenseness and irritability. In diets 1 and 3 restriction of phenylalanine was accomplished by the use of casein hydrolysates from which phenylalanine had been removed and other amino acids added. The intake of phenylalanine was limited in diet 2 by the restriction of total intake of protein in the diet. Diets 2 and 3 were commercial preparations. Nutritional disturbances were encountered as a result of amino acid deficiencies in diet 1. Inadequate caloric intake and low-protein intake contributed to poor nutritional status at 1 stage in the treatment. Biochemical abnormalities characteristic of phenylketonuria were improved when phenylalanine was restricted in the diets of the 3 children. The improvement in behavior, motor control, and ease of handling was such that the parents were unwilling for the children to receive diets with the normal content of phenylalanine.

Hydramnios as an Aid to the Early Diagnosis of Congenital Obstruction of the Alimentary Tract: A Study of the Maternal and Fetal Factors. J. R. Lloyd and H. W. Clatworthy. Pediatrics 21:903-909 (June) 1958 [Springfield, Ill.].

The authors report on 220 patients with alimentary tract obstruction of congenital origin, who were admitted to the Columbus (Ohio) Children's Hospital. Thirty of these infants (23 of the 49 infants with obstruction of the small intestine proximal to the first 15 cm. of the jejunum and 7 of the 53 infants with esophageal atresia) were delivered of hydramnic mothers. None of the remaining 118 infants whose anatomic obstruction was distal to a point 15 to 20 cm. beyond the ligament of Treitz were delivered of mothers with hydramnios. Among the 17,615 deliveries conducted at the Ohio State University Hospital during the years from 1950 to 1955, 76 cases of hydramnios occurred, which should be divided into 4 main groups. Group 1 included 30 normal healthy babies from hydramnic mothers in whom the measured amount of amniotic fluid varied from 2,000 to 3,500 ml. Group 2 included 29 abnormal infants who showed definite evidence of anatomic or functional abnormality that interfered with normal deglutition or alimentation; yet these developmental defects involving the alimentary tract were not always apparent on inspection at the time of birth. The amount of amniotic fluid in the hydramnic mothers varied from 2,000 to as much as 8,000 ml., the largest amount being observed when the fetus had anencephaly or was stillborn and macerated. Group 3 included 13 mothers in whom the hydramnios was associated with a diffuse generalized metabolic process involving both the mother and the child; with the exception of the obvious stigmata of diabetic progeny, all the babies were viable and normal. Group 4 included 2 cases of diabetes and a single case of toxemia among the mothers, 1 mother being delivered of a viable infant with several loops of cord around the neck. Three infants were stillborn, and in each case the hydramnios of the mothers was of a severe degree (2,500, 5,000, and 6,000 ml. of amniotic fluid).

The hydramnios was of mild or moderate degree in the groups with abnormal mothers, 17% of whose offspring were malformed, whereas in the 2 groups with normal mothers nearly one-half of the fetuses were abnormal. Hydramnios appears to be of particular importance when it occurs during the last trimester of an otherwise normal pregnancy. In such instances it is frequently of a more marked degree and forebodes a major fetal anomaly in nearly half of the cases. Otherwise, normal-appearing infants who are delivered of mothers with hydramnios should be suspected of having obstructive disease. That some hidden intrinsic obstructive lesion will be found by such studies appears to be the expectation in about 11% of all cases so examined

Minor Motor Epilepsy: Diagnosis, Treatment and Prognosis. S. Livingston, V. Eisner and L. Pauli. Pediatrics 21:916-928 (June) 1958 [Springfield, Ill.].

All socioeconomic groups were embraced in this study of 698 children with minor motor epilepsy seen at the children's epilepsy clinic of Johns Hopkins Hospital. The patients ranged in age from 3 weeks to 5½ years: 369 were males and 329 were females. Of 622 patients in the follow-up study, 220 have been followed for 3 to 10 years, and the remaining 402 for 10 to 22 years Three types of seizures were encountered in the following order of frequency: (1) massive myoclonic, (2) head nodding; and (3) akinetic. Minor motor seizures rarely begin after the patients are 4 or 5 years of age and are frequently preceded or accompanied by major motor seizures. Of the 698 patients, 192 had 1 or 2 major motor seizures prior to the appearance of the minor motor seizures, 86 of these patients continued to have both major and minor motor seizures for a period of time thereafter, the remaining 106 having no recurrence of major seizures. Mental retardation was present in 657 (96%) of the 671 children evaluated at the age of 1 year. Clinical evidence of varying degrees of brain damage before the onset of seizures, such as developmental retardation, cerebral palsies, and impairment of vision, was exhibited by 601 (86%) of the 698 patients. A demonstrable motor defect of central origin, the most common of which was the spastic type, was apparent in approximately 50% of the patients by the time they were 2 years old. While the etiology of minor motor epilepsy cannot be definitely stated, the records reveal an association with cerebral injury or damage in 445 (68%) of the 698 patients, the most common being a cerebral birth injury (trauma and/or anoxia) which occurred in 225 (32%), 14% of the infants were premature. The second most common cause was a congenital defect in cerebral development, followed by some variety of meningitis or encephalopathy. Death occurred before the 6th year of life in 23 patients. Four deaths were due to traumatic injury associated with seizure; 3 patients died in status epilepticus; 10 patients were found dead in bed, death presumably having been caused by suffocation; and 6 died of acute infections. Only 11 of the remaining 457 patients had normal intelligence, 142 of the original 622 patients in the follow-up study having been institutionalized between the ages of 3 and 12 years. Three patients who appeared to have normal intelligence at 1 year of age now exhibited evidence of retardation. The follow-up studies would seem to indicate that the frequency of minor motor seizures tends to decrease spontaneously with increasing age and that these spells disappear almost completely by the time the patient reaches 5 years of age. However, these studies also indicate that the patient with minor motor epilepsy frequently develops other types of seizures, particularly major motor seizures, as he grows older. Only 2 of the 285 patients who were 5 years of age or older were still having minor motor seizures, 107 suffered major motor seizures, 33 had psychomotor attacks, and 143 had been free from all seizures for periods ranging from 2 to 18 years. The hypsarrhythmic pattern disappeared from the electroencephalograms of 330 of the 381 patients who previously displayed this pattern by the time they were 5 years of age and from the tracings of the remaining 51 patients before they were 7. A ketogenic diet is postulated as being the best therapy for minor motor epilepsy, complete control of spells having been obtained in 91 (49%) of 186 patients with this form of therapy.

Nephrectomy in Juvenile Hypertension Associated with Renal Disease: Report of 15 Cases. H. C. Welch, L. E. Harris and J. H. DeWeerd. Pediatrics 21:941-949 (June) 1958 [Springfield, Ill.].

In the past 20 years 15 children were subjected to a nephrectomy at the Mayo Clinic because of apparent renal ischemia and associated renal hypertension. Renal disease was interpreted as unilateral in 11 children and bilateral in 4. Nephrectomy was ineffectual in reducing the hypertension in the latter group, even though changes were predominant in one kidney and apparently minor in the other. Transient decreases in blood pressure were noted in 3 of the 4 children, but hypertension was again severe within a year. Three were dead within 2 months to 6 years after nephrectomy, and in 1 the blood pressure was unchanged after 2½ years. Of the 11 children in the group with unilateral renal disease, 8 had an initially good response to nephrectomy, and a good late response was noted in the 6 on whom follow-up studies were available. Three patients had an equivocal early response—in all 3 prompt decreases in blood pressure were noted; however, blood pressures were not normal by Smith's criteria at the time of discharge. Two of the 3 patients have been observed for more than 1 year, and both have had a return of blood pressure to normal, indicating that failure of the blood pressure to reach normal promptly does not preclude the possibility of a later return to normal. Five of the 10 patients with an early good response or a late good response or both were found to have had chronic pyelonephritis. Three others had hypoplastic kidneys, 1 had hydronephritis, and 1 had a pseudocyst of the kidney. In 1 case in which there was an early equivocal response, the renal lesion was due to obstruction of the renal artery. The presence of hypertension in a child requires thorough investigation, as the etiology may be the secondary type of hypertension and thus curable.

Recurrent Pheochromocytoma: Report of a Case in a Previously Treated Child. T. E. Cane Jr. Pediatrics 21:994-999 (June) 1958 [Springfield, Ill.].

The author describes the clinical course of an 8-year-old boy who was operated on for a recurrent pheochromocytoma of the neck 29 months after the successful surgical removal of the same type of tumor from the right renal area. The patient remained in excellent health after the removal of the original pheochromocytoma and, when he was discharged from the hospital 10 days after the operation, the concentration of catechol amines in the plasma was 8.1 mcg. per liter of arterenol and 0.7 mcg. per liter of epinephrine. The total urinary excretion of catechol amines, determined 5 and 7 days before the second operation, was 1,860 and 2,670 mcg. per 24 hours respectively. The concentration of the catechol amines in the plasma was 13.3 mcg. per liter of circulating arterenol and 1.0 mcg. per liter of epinephrine. These values are above normal. A diagnosis of functionally active pheochromocytoma was made. Two days after operative intervention the concentration of catechol amines in the plasma was 3.8 mcg. per liter of arterenol and 3.2 mcg. per liter of epinephrine.

The tumor was an encapsulated ovoid mass weighing 15 Gm., having the characteristics of a pheochromocytoma, and containing 5 mg. of arterenol per gram of tissue and no significant amount of epinephrine. No previous report of a recurrent pheochromocytoma developing at a different site many months after the successful removal of the primary pheochromocytoma could be found. The return of the concentration of the catechol amines to normal from the abnormally elevated preoperative values after the first operation for removal of a pheochromocytoma would seem to rule out the possibility of an undetected additional tumor at the time of the original operative procedure.

Otitis in Nurslings: Result of BCG Vaccination. N. I. Soboleva. Arkh. pat. 20:67-73 (No. 4) 1958 (In Russian) [Moscow].

The author had observed in a number of nurslings a peculiar type of otitis developing apparently in connection with the administration of BCG vaccine by mouth in liquid form. The otitis was characterized by granulations on the tympanic membrane and a purulent discharge from the ear. Removal of granulations and administration of PAS, Streptocide, and streptomycin brought about recovery. Myringotomy was performed in a few cases in which the condition deteriorated. The postoperative course was uneventful. Microscopic examination of the postoperative specimens suggested a tuberculous process. The granulation tissue and nodes showed a marked tendency toward fibrosis. Bacteria identical with the BCG strain were isolated in some of the cases. These pathological changes in the middle ear were in all probability related to the administration of liquid BCG vaccine by mouth.

Generalized Congenital Analgesia. M. Lamy, R. Garcin, M. L. Jammet and others. Arch. franç. pédiat. 15:433-448 (No. 4) 1958 (In French) [Paris].

Generalized congenital analgesia was discovered in a young child hospitalized for severe lingual ulceration. The ulceration had started when the child was 9 months old, at the time when the first teeth appeared. At the age of 16 months analgesia was generalized and complete. It was not associated with any vegetative, affective, or intellectual reaction to excitation which is normally painful. It was isolated, without any other sensitive disturbance, and without any other neurological disorder. At the age of 26 months a certain sensitivity to pain seemed to appear, especially to pricking and to chilling. Skin biopsy revealed nerve fibers with free terminations. The authors discuss other cases of this peculiar condition which have been reported in the literature often under different names.

DERMATOLOGY

Streptomycin Dermatitis in Nurses. H. T. H. Wilson. Brit. M. J. 1:1378-1382 (June 14) 1958 [London].

A variety of dermatoses, which include pruritus, erythema, eczema, photosensitivity, urticaria, exfoliative dermatitis, and purpura, have been reported in patients treated with streptomycin. Over a period of 8 years, 14 cases of streptomycin dermatitis were seen among the nursing staff of a London hospital, and 2 more were referred from elsewhere. One of the patients was a male nurse, the remainder being female. The sites most often affected were the sides and backs of the fingers, the backs of the hands, the forearms, the elbow flexures, and the face. All cases were patch-tested against a 5% aqueous solution of streptomycin and penicillin (1,000 units per milliliter). Positive patch reactions were elicited in all except the male nurse, who was negative on 2 separate occasions but gave a positive intradermal reaction associated with a flare-up on the affected parts of the face and hands. Generally, once a nurse has acquired a high degree of sensitivity to streptomycin, she (or he) can seldom if ever handle the antibiotic again. One nurse lost her sensitivity 2 years after the initial outbreak, and another nurse showed diminution of sensitivity within 2 to 3 years; the remainder exhibited little, if any, loss of sensitivity during the period of observation unless steps had been taken to desensitize them. Desensitization was attempted in cases where it was not practical for the nurses to actively avoid handling the substance. Six of the nurses were successfully desensitized, with a relapse in one case and a partial relapse in another.

Kaposi's Sarcoma Superimposed on Erythroderma Psoriaticum. A. E. Segal and M. J. Costello. A. M. A. Arch. Dermat. 77:642-647 (June) 1958 [Chicago].

The authors report on an 84-year-old woman with simultaneous occurrence of erythroderma psoriaticum and Kaposi's multiple idiopathic hemorrhagic sarcoma. The patient was admitted to the service of dermatology and syphilology of the Bellevue Hospital Center in New York and was treated for universal erythroderma psoriaticum with hydrocortisone given orally in doses of 80 mg. daily and weekly intramuscular injections of corticotropin (Acthar) gel for 4 months. She then was given prednisone (Meticorten) orally in doses of 20 mg. daily, and treatment was continued indefinitely with a maintenance dose of 15 mg. daily. The psoriasis during this period was characterized by remissions, during which the erythroderma faded and distinct plaques of psoriasis remained. Attacks of intermittent diarrhea and constipation occurred 1 year after admission. Two years after admission and 7 years after the first manifestation of psoriasis, well-circumscribed, reddish-purple nodules, 4 to 8 mm. in diameter, were noticed. These were semihard and tender. The lesions appeared simultaneously on the extensor surfaces of the extremities, the buttocks, the chin, and the left upper-eyelid. A few days later the palms and soles were involved with similar lesions. Two weeks later blood occurred in the stools, and this was followed by constipation and diarrhea of short duration. Enlarged, slightly tender lymph nodes in the left supraclavicular, axillary, and inguinal regions were observed. Biopsy specimens of psoriatic skin from the back and of a nodular lesion from the back clarified the diagnosis of chronic dermatitis of psoriasiform type and of Kaposi's sarcoma respectively.

Aqueous crystalline penicillin G was given in doses of 500,000 units every 8 hours until a total dose of 20 million units was administered. At the termination of this course of treatment the nodular lesions had regressed 20%. A course of potassium arsenite (Fowler's) solution was administered; the patient's general condition became worse, the erythroderma became severe, but no essential change was noted in the nodular lesions. A total dose of 300 r, administered in 3 weekly treatments to 2 nodular lesions on the palm and on the wrist, resulted in complete disappearance of the lesion on the wrist. The patient died, and autopsy was performed. The final anatomic diagnosis was Kaposi's idiopathic hemorrhagic sarcoma with involvement of the skin, pharynx, stomach, small and large intestine, peripancreatic adipose tissue, epicardium, and mammary lymph nodes, thromboembolism of the pulmonary arteries, and chronic ulcers of the stomach. The distribution of the sarcomatous lesions was classic. There was one unique feature, however: the distribution of epicardial and peripancreatic lesions along the course of the medium-sized muscular arteries. This distribution was not noted in the gastrointestinal tract where more of the mucosal distribution was seen. There have been no similar reports in the literature of the simultaneous occurrence of erythroderma psoriaticum and Kaposi's multiple idiopathic hemorrhagic sarcoma in the same patient.

A Case of Fatal Metastasizing "Erythroplasia." M. Witham, M. Garretts, A. Levine and A. Jarrett. Brit. J. Dermat. 70:201-210 (June) 1958 [London].

The case reported is thought to provide a link between the erythroplasia of Queyrat, the plasma-cell type of Zoon, and a sweat-duct carcinoma. Erythroplasia was described by Queyrat in 1911, and it was generally regarded as a precancerous lesion. Darier identified it with Fournier's "epitheliome papillaire nu," pointing out that the surface is brilliant red and velvety and that it develops into an invasive prickle-cell epithelioma; he also mentioned that these lesions are sometimes found on nonmucocutaneous parts of the skin, side by side with typical Bowen's disease. Zoon in 1950 and 1952 observed cases of erythroplasia characterized histologically by a plasma-cell infiltrate beneath a villous epidermis. He regarded the condition as benign, and so differentiated it from Queyrat's erythroplasia. The authors' patient presented himself with numerous psoriasiform patches of Bowen's disease and 1 large brilliant red plaque resembling erythroplasia. Histologically, one portion of the erythroplasic plaque had the structure of Zoon's type, and another portion showed. Bowenoid changes in the epidermis. Later, this plaque became frankly malignant and spread rapidly as "cancer en cuirasse." It also gave rise to copious visceral metastases which proved fatal. Some of these resembled metastases from a breast cancer. Renewed histological studies of the erythroplastic plaque revealed, in the earlier biopsies, evidence of sweat-duct proliferation and, in the later ones, features resembling nevus syringoadenomatosus papilliferus, except that the duct cells had become malignant and filled the lumen. Some of the visceral metastases showed similar features. It is suggested that this is a case of sweat-duct carcinoma with features indicating relationship between nevus syringoadenomatosus papilliferus, Paget's disease, both types of erythroplasia, and some cases of Bowen's disease.

UROLOGY

Primary Amyloidosis of the Ureter. B. F. Andreas and M. Oosting. J. Urol. 79:929-931 (June) 1958 [*Baltimore*].

Amyloidosis of the genitourinary tract is relatively rare, but several cases involving the bladder have been reported, as well as 1 case involving both the renal pelvis and the ureter. Since the authors were unable to find any previous cases in the American literature involving only the ureter, they report their observations on a 12-year-old girl who had primary amyloidosis of the ureter. The presenting symptoms were pain in the costovertebral angle and hematuria. On surgical exploration the lower third of the ureter was found to be dilated to approximately 1 cm., and the wall of the ureter in this region was markedly thickened and showed what appeared to be a severe inflammatory process. A left-sided ureteronephrectomy was performed; the patient's postoperative course was uneventful. The small, pale kidney weighed 60 Gm. with 15 cm. of ureter attached. The distal portion of the ureter was dilated and thickened, having a waxy, granular appearance, with patches of hemorrhage. The mucosa showed areas of hyperplasia as well as ulceration. Hematoxylin and eosin stains suggested a degenerative process as seen in amyloidosis. Subsequent sections stained with Congo red dye as well as with crystal violet gave the reactions characteristic of amyloid deposition. Two and one-half years later the child was in good health, of normal weight for her age, and free of genitourinary complaints.

Cystic Disease of the Kidney in Infants. J. W. Hooper Jr. J. Urol. 79:917-924 (June) 1958 [Baltimore].

The author presents a clinical classification of cystic disease of the kidney in infants, which is based on a review of the literature. He lists the following types: (1) unilateral multicystic kidney; (2) multilocular cystic kidney; (3) solitary renal cyst; (4) bilateral multicystic kidney; (5) infantile polycystic kidney; (6) adult polycystic kidney found in infancy; and (7) calyceal cyst. He briefly comments on these forms and then presents the histories of 7 patients who were observed during the past 4 years. Two of the 7 infants had unilateral multicystic or polycystic kidney, and 1 had bilateral multicystic kidney. Two cases of congenital-type polycystic kidney are presented, occurring in identical twins, and, finally, an unusual case of calyceal cyst of the kidney and a case of adult polycystic kidney in an infant are presented. Unilateral polycystic or multicystic kidney, large solitary renal cysts of infancy, and multilocular cyst of infancy should be treated by surgery. Bilateral multicystic kidney and bilateral congenital polycystic kidney are incompatible with life. Adult polycystic kidney in infancy is recognized rarely, and the treatment is merely supportive.

The Cytodiagnosis of Prostatic Carcinoma: A Follow-Up Study. I. N. Frank and W. W. Scott. J. Urol. 79:983-988 (June) 1958 [Baltimore].

The authors have been concerned for the past 8½ years with the application of exfoliative cytology to the diagnosis of prostatic carcinoma. During this period, a total of 10,410 slides were examined from 2,445 patients in the age range in which this lesion is most prevalent. The specimens for examination were obtained by prostatic massage in practically every instance. It was the impression of the clinicians that routine massage creates no demonstrable increase in the spread of the disease or over-all morbidity. In fact, a review of cases in which radical perineal prostatectomy was performed on patients from this clinic yielded survival rates which compared favorably with other such series reported. Most of these patients had been subjected to diagnostic prostatic massage prior to surgery and, in many cases, repeated massage. Adequate specimens are most readily obtainable by moderate lateral to medial digital pressure on the prostate, followed by a milking compression down the median furrow to the region of the membranous urethra. An effort is made to avoid the seminal vesicles, since the secretions from these structures dilute and mask the prostatic material. This technique is no more traumatic than the prostatic massage method used by most urologists in their treatment of chronic prostatitis.

The following are listed as cytological criteria of malignancy: variation in size and shape of nuclei; hyperchromatism; crowding of cells and overlapping of nuclei (in sheets); bizarre, irregular nuclei; chromatin stippling and patches, single large or multiple nucleoli with altered nucleoli-nuclear ratio, mitotic figures (rarely seen), and cast-like cell groupings. Five different classes of cytological smears were differentiated: class 1 was characterized by absence of abnormal or atypical cells; in class 2 smears atypical cells were present but without abnormal features; in class 3 smears there were cells with abnormal features but not sufficiently pathognomonic, in class 4 smears large numbers of pathognomonic cells and cell clusters were found, and in class 5 smears large numbers of conclusive cells and cell clusters existed. Class 3 smears were considered suggestive of cancer, and the smears of classes 4 and 5 as cancer positive.

There were 296 patients with these 3 types of cytological smears, that is, 70 with class 3, 159 with class 4, and 67 with class 5 smears. Carcinoma was definitely demonstrated in 46.7% of those with class 3 smears, in 83.8% of those with class 4 smears, and in 97% of those with class 5 smears. False-positive and false-negative reports are discussed. The authors feel that the prostatic smear does offer a useful adjunct to the diagnosis of prostatic carcinoma. The information obtained from this procedure, used in conjunction with clinical impression, x-ray reports, phosphatase studies, and biopsy, should give maximum accuracy of diagnosis. The authors are presently evaluating the additional determination of the prostatic acid phosphatase, which they consider to be a more accurate and sensitive measure than the total serum acid phosphatase. The specimen for cytological examination may be readily collected at the time of the patient's first visit and repeated as needed. On the average, 2 specimens were obtained by massage per patient in this series.

True Hermaphrodite Siblings. W. A. Milner, W. B. Garlick, A. J. Fink and A. A. Stein. J. Urol. 79:1003-1009 (June) 1958 [Baltimore].

True hermaphroditism has been defined as the presence in the same individual of both ovarian and testicular tissues. The 68 cases reported probably represent only a small part of the actual incidence. There have been no previous reports on true hermaphroditism in siblings. The authors present 2 "brothers" who were proved to be true hermaphrodites. A 13-year-old boy was admitted to hospital with an undescended left testis. There were 1 older male sibling, aged 17 years, considered to be normal, and a 12-year-old brother and a 5-year-old sister also without genital anomalies. A 1-year-old brother, however, was stated to have a marked chordee, penoscrotal hypospadias, and undescended right testis.

In the 13-year-old boy a small testis was palpable in the left inguinal canal, but it was not possible to bring it down to the scrotum manually. The right testis was in the scrotum, and a pea-sized nodule was palpable on its upper pole. The penis presented a balanitic one-degree hypospadias. A specimen was taken from the lower pole of the left testis for biopsy. The next day, a left-sided orchiopexy and hernia repair with the scrotal placement of a normal-appearing testis and epididymis were performed. Division of the rudimentary chordee was likewise accomplished. A right-sided scrotal exploration then revealed a brown, abnormal-appearing testis, seemingly enclosed in a translucent serous membrane with a normal, loosely attached epididymis. The upper pole of the testis consisted of a firm, rubbery, brown nodule which shelled out easily from its testicular bed. Frozen section revealed a sclerosed testis containing a few small cystic spaces. Permanent sections showed an atrophic sclerosed testis surrounded by dense fibrous tissue which merged into typical ovarian tissue containing multiple graafian follicles. About 18 months later the boy complained of progressive breast enlargement and monthly recurring breast tenderness. Laparotomy and bilateral scrotal explorations were performed. Examination of the pelvis did not reveal any female structures, and each vas deferens to the internal inguinal ring was also normal. The pelvic outlet was androgynoid. The right gonad and spermatic cord were mobilized, and the smooth, ovoid gonad was subjected to bipolar biopsy. The upper pole revealed a focally sclerosed and inflamed epididymis. The inferior pole showed a testis displaying inactive spermatogenesis with moderate interstitial-cell hyperplasia. Attention was then directed to the left gonad, which appeared rudimentary with a thin translucent-like tunica albuginea and slightly nodular in its superior pole. It was felt that the upper pole represented an ovarian segment of an ovotestis. On frozen-section examination, this tissue was again reported as showing inactive spermatogenesis and interstitial-cell hyperplasia. Biopsy of the lower pole revealed ovarian tissue containing numerous ova and some follicular cysts. The left gonad was excised.

In the younger brother the exploration of both testes also revealed ovarian tissue. The association of the combination of hypospadias and cryptorchidism, present in almost all the previously reported instances of true hermaphroditism, was similarly noted in these 2 siblings. The authors believe that the presence of a testicular nodule combined with an external genital defect should suggest the diagnosis of true hermaphroditism and indicate the need for surgical exploration. Surgical sexual gonadal separation in the majority of ovotestes is feasible and histologically complete. The finding of true hermaphrodite siblings has given indirect support to the geneticists in their controversy concerning the etiology of this condition.

THERAPEUTICS

Clinical and Laboratory Studies with Chlorothiazide: An Oral Diuretic. W. C. Watson, T. J. Thomson and J. M. Buchanan. Lancet 1:1199-1201 (June 7) 1958 [London].

The authors investigated the nature and degree of diuresis obtained with chlorothiazide in various clinical states associated with retention of fluid. Twenty-six "acute" experiments were performed on 22 patients with the following clinical conditions: congestive heart-failure, cor pulmonale with cardiac edema, preeclamptic toxemia of pregnancy, chronic azotemic uremia, nephrosis, hypertension, hepatic cirrhosis with ascites and edema, fulminating bronchiolitis and acute congestive heart-failure, and "steroid" edema. The term "acute" experiment implies the effect of a single oral dose of 2 Gm. of chlorothiazide. The patient's urine was collected for 24 hours up to 9 a. m. on the day of the test. At 9 a. m. he was given 2 Gm. of chlorothiazide, and the next 24 hours' excretion of urine was collected in 2 amounts—a 6-hour fraction and an 18-hour fraction. Each sample of urine was measured, its pH recorded, and its sodium, chloride, and potassium concentration estimated. Samples of blood were taken at the end of each collection period, and their protein, urea, sodium, chloride, potassium, and alkali reserve were estimated.

There was considerable increase in the flow of urine, which is greater in the 6 hours immediately after the administration of chlorothiazide. The diuresis induced by chlorothiazide is associated chiefly with an increased excretion of sodium and chloride. When the serum levels of these electrolytes are low, the drug will not compel their excretion: in such circumstances it tends to promote the excretion of potassium and bicarbonate. Hypochloremia can easily be corrected, however, by administering ammonium chloride, and this simple expedient might augment the diuretic action of chlorothiazide in such patients as it augments the action of mersalyl. In general, the best diuretic response occurred in the type of patient who responds well to mersalyl. In patients with pulmonary heart disease the response was disappointing. After 6 months' experience with chlorothiazide the authors are not certain that tolerance develops; nor are they convinced that a regimen of divided doses (i. e., 10 Gm. twice daily) has any clinical advantages. They feel that, unless there are urgent reasons for obtaining a maximal diuresis, single doses are preferable because they avoid the fatigue of unnecessary nocturia.

Preliminary Report on Clinical and Bacteriological Observations in Treatment of Specific Pulmonary Diseases with Ethereal Oils (Oleum Spicae) in Combination with Streptomycin. A. Liener. Beitr. Klin. Tuberk. 118:148-161 (No. 3) 1958 (In German) [Berlin].

Combination therapy to prevent the development of resistance on the part of the tubercle bacilli against antibiotics was particularly important to Liener, because a large percentage of the patients at his hospital had extensive and old lesions in which long-term antibiotic therapy was necessary. Since the combined use of antibiotics involves the problem of the development of hypersensitivity in the patient, he deemed it advisable to investigate Stickl's observation that the addition of small amounts of ethereal (volatile) oils would greatly increase the bacteriostatic effects of streptomycin. First, in vitro tests were made on tubercle bacilli cultures with streptomycin and the volatile extracts of spike lavender oil (oleum spicae). This volatile oil was used because an injectable preparation of this oil (known as Tavipec) was available. A trial in patients was then begun with a small daily dose of 250 mg. of streptomycin. In addition the patients were given in the morning and in the evening an intramuscular injection of 1 ampule of the preparation of spike oil. Patients with especially severe lesions were given the spike oil also by inhalation. All 51 patients who were subjected to this treatment were kept under strict bacteriological and clinical control, and when there were signs that the process became progressive, the therapy was changed.

The author emphasizes that this is a preliminary report, which aims to induce others to study the combination therapy of streptomycin with volatile oil on larger numbers of patients. In his series the development of resistance to streptomycin was definitely delayed by giving streptomycin in the small dose of 250 mg. daily, together with 2 ampules of the volatile spike oil. The probability that the action of antibiotics is potentiated by the parenteral administration of the volatile extracts of spike oil was greatly increased by the reported observations. The therapeutic results obtained (even admitting the limited number of patients) compared favorably with those obtained with other forms of combination therapy. Further studies will be necessary to ascertain whether optimal effects were obtained with the dosage used. The method did exert a therapeutic effect. No serious secondary effects were produced with the spike oil.

PATHOLOGY

Carcinoma of the Stomach in Hiroshima, Japan. E. S. Murphy. Am. J. Path. 34:531-542 (May-June) 1958 [Ann Arbor, Mich.].

Carcinoma of the stomach is the most frequent neoplastic disease for both men and women in Japan. In 1955 it was decided that the pathology department of the Atomic Bomb Casualty Commission should undertake an investigation of the occurrence of carcinoma of the stomach in the population of Hiroshima. The aim was to determine any differences in incidence, age of onset, or type of gastric tumor occurring in the population group exposed to mass irradiation as compared with a nonexposed population. A total of 535 patients with carcinoma of the stomach were listed in the surgical and autopsy records of the Hiroshima commission between Dec. 1, 1948, and June 30, 1957. Of these patients, 187 had been exposed to the explosion of the atomic bomb. No significant differences were found between the exposed and the nonexposed groups for the average age at the time of diagnosis, the age distribution in 5-year age groups, the postoperative survival time, or the histological pattern and location of the tumor in the stomach. The incidence of all neoplasms in the exposed and nonexposed groups was also calculated and found to be almost equal. The possibility that the definition of "exposure" was too broad and was thus hiding effects in the patients exposed at 2,500 meters or less was considered, and the material was reexamined with 2,500 meters from the hypocenter as the limit of exposure. The patients exposed at between 2,500 and 10,000 meters were added to the control group. The incidences of carcinoma of the stomach and of all neoplasms were again calculated and again found to be approximately equal. In the patients treated by a surgical resection of the cancer through 1956, a follow-up was possible in 252; 93 of these were still living, but only 7 had lived more than 5 years after the operation. Only 1 of these was an exposed patient, but no significance was attached to this finding.

Bacteriological Studies on Hospitalism and Its Epidemiology with Consideration of Serologic Methods for Differentiation. P. Naumann and W. Heusser. Chirurg 29:193-198 (May) 1958 (In German) [Berlin].

In an attempt at prophylaxis against hospital infections caused particularly by therapy-resistant coagulase-positive strains of staphylococci, the authors carried out bacteriological studies in 7 departments of the surgical clinic of the University in Hamburg, Germany. Smears obtained from wounds of patients, rhinolaryngeal smears obtained from the hospital staff, and the hands of the latter were studied in order to ascertain the various possibilities of transmission along the pathway of the infection. One hundred twenty-four wound smears were obtained from 114 patients, and 47 strains of Staphylococcus pyogenes var. aureus were cultured from the specimens obtained from 46 of these patients. Thus, 46 (about 40%) of these 114 patients were infected by pyogenic staphylococci. Forty-five (about 96%) of the 47 strains of staphylococci were resistant to penicillin. Twenty-three of 34 staff members (10 physicians, 20 nurses, and 4 administrative workers) were carriers of pyogenic staphylococci; of the 37 isolated strains, 30 were obtained from rhinolaryngeal smears of the hospital staff, and 7 were obtained from the hands of these staff members. Thirty-two of the 37 strains were resistant to penicillin. These data corresponded with those obtained by other workers. A study of the dust in the air of 15 hospital wards showed that in 13 of these wards dust particles in the air were infected by pathogenic staphylococci, and of 25 strains cultured, 19 were resistant against penicillin and streptomycin. Bacteriological examination of 30 woolen bed covers revealed pathogenic staphylococci in 3 of these covers. Strains of coagulase-positive staphylococci were obtained from 2 of 24 roentgen-ray films examined for the presence of such bacteria.

Since the behavior of staphylococci against antibiotics does not represent a property which is unchangeable, and since this behavior depends to a great extent on the type of antibiotic preparation employed for treatment, conclusions cannot be drawn from this behavior. Consequently serologic typing of the 114 strains of staphylococci which were obtained by culture was carried out according to the techniques devised by Cogan and Oeding and modified by Grun. Most of the strains belonged to the ABCE, AB, and B antigen groups. The AB strains were definitely identified as so-called hospital bacteria according to their distribution among the hospital staff and their occurrence in the dust particles in the air and in the bed covers as well as because of their frequent occurrence in secondary-infected wounds. Concerning the strains with the ABCE and B antigen structure, it could only be suspected that they had originated from members of the nursing staff. With the aid of sensitivity tests to antibiotics and of serologic methods, the bivalent differentiation of pathogenic staphylococci by several characteristics which do not depend on one another thus has proved itself as an essential expedient in the detection of sources of infections due to the so-called hospital staphylococci and of the path of their spread.

BOOK REVIEWS

Mould Fungi and Bronchial Asthma: A Mycological and Clinical Study. Volume I. By P. J. van der Werff, Head of Amsterdam Clinic for Allergic Diseases, Amsterdam. With foreword by Prof. Dr. Johanna Westerdijk, Director of Centraalbureau voor Schimmelcultures, Baarn, Netherlands. Cloth. $7.50. Pp. 174, with 67 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; H. E. Stenfert Kroese N. V., Pieterskerkhof 38, Leiden, Holland, 1958.

In the last 25 years or so, the importance and frequency of hay fever and asthma from the airborne spores of molds have been largely investigated by American workers, but before this period the Dutch physician, W. Storm van Leerwen, conducted experiments which pointed to molds as a common cause of asthma. The author of this volume is a disciple of Kremer who was associated with van Leerwen. It is thus particularly appropriate that the most complete presentation on this subject is written by such a man. The book describes climates in relation to mold allergy, gives a survey of general mycology, and gathers the findings from all over the world on the presence of mold spores in the open air, in homes, and in special occupational environments. Ample data are given for the preparation of a variety of culture mediums. There are a large number of photographs of molds. Some are excellent, but many could be improved if they are to serve a teaching purpose. The references are quite complete. The clinical allergic and immunological aspects are reserved for a second volume. This book will interest every one seriously interested in allergy as well as mycology.

High Arterial Pressure. By F. H. Smirk, M.D., F.R.C.P., F.R.A.C.P., Professor of Medicine, University of Otago, Dunedin, New Zealand. Cloth. $15. Pp. 764, with illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1957.

This book is presented "for consecutive reading and for reference on problems arising in practice." Those sections dealing with the several areas to which the author has made personal contributions are enthusiastically presented and are correspondingly interesting. The concept of essential hypertension as the culmination of a series of repetitive pressor episodes of varied origin accords with most current thinking. Chapters on the incidence and prognosis of hypertension provide useful statistical compendiums. The presentation is extensive but lacks proportion. Even the best sections devote much space to more or less irrelevant details and tend, thereby, towards tedium. Thus, it seems unnecessary to consider the ganglion blockers, including some of dubious marketability or interest, individually in such great detail. Some sections, notably, those removed from the author's direct interests, seem to have been assembled without much attempt at evaluation from a large but not comprehensive bibliography. Certain chapters do not convey as much information as seems desirable. The discussion of arteriosclerosis is sketchy. Consideration of hypertensive encephalopathy focuses on transient cerebral attacks rather than on the ominous syndrome of rising arterial pressure, increasing headache, and progression from stupor to coma. Anticoagulant treatment of cerebrovascular disease is not considered. Pyelonephritis, an important remediable cause of hypertension, is hastily dealt with, with no consideration of the indications for or interpretation of sediment counts, quantitative urine cultures, or urograms. Renal artery lesions are reviewed as causes of hypertension but without discussion of their diagnosis by angiography or other means. The description of aldosteronism conveys no recognizable picture. It would seem arbitrary to list hydralazine under "drugs mostly of academic interest" and premature to suggest that the rauwolfia alkaloids are substantially, rather than quantitatively, different in their psychic effects or that mecamylamine shows little cross tolerance as compared to other ganglion blockers. Most persons will use this as a reference book. Few will be tempted to read it consecutively. As concerns problems of practice, its best function is to provide detailed authoritative information on the treatment of hypertension with ganglion blockers alone or in combination with reserpine and on the organization of a clinic for this purpose. The author is to be commended for his insistence on the need for vigorous maximal control of high arterial pressure in patients with hypertensive disease. His experience justifies this, and the point is not generally appreciated. His comments on the psychic gain experienced by patients whose severe hypertension is brought under control describe an elusive but significant aspect of such treatment.

Advances in Cancer Research. Volume V. Edited by Jesse P. Greenstein and Alexander Haddow. Cloth. $10.80. Pp. 463, with illustrations. Academic Press, Inc., 111 Fifth Ave., New York 3, 1958.

This book should be of interest to experimentalists in several disciplines but will be of little interest to the average clinician except in its discussions of primary cancer of the liver (by Berman, of South Africa) and of tumor-host relations (by Begg, of

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These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

the University of Western Ontario). Other topics discussed are protein synthesis and growth processes, the newer concept of cancer toxin, chemically induced tumors of fowls, anemia in cancer, specific tumor antigens, and the chemistry and carcinogenicity of 2-fluorenamine and related compounds. The international flavor of the volume is indicated by contributions from Russia, England, Japan, Scotland, and the United States. Berman concludes that environmental factors, both cirrhotogenic and carcinogenic, are probably responsible for hepatic neoplasia occurring in a favorably prepared "soil" largely determined on a nutritional basis. Price and Greenfield (of the National Cancer Institute, U. S. Public Health Service) emphasize the inadequacy of understanding of the mechanisms of anemia in the patient with cancer and the need to explore vascular influences in erythrocyte destruction. Tables and figures are few in number. There are no illustrations. Extensive reference lists are appended to each chapter, with an all-inclusive author index. The type is admirably readable.

Methods in Physical Education: An Illustrated Textbook for Students Preparing to Teach Boys and Girls in Secondary Schools. By Hilda Clute Kozman, Ph.D., Rosalind Cassidy, Ed.D., Professor of Physical Education, University of California, Los Angeles, and Chester O. Jackson, Ed.D., Professor of Physical Education, University of Illinois, Urbana. Third edition. Cloth. $6. Pp. 519, with illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

This is the third edition of a textbook for prospective teachers in secondary schools. Its methods and approach are much improved over those of the previous editions. Noteworthy is the greater degree of personalization for the student, with stress on self-direction, self-management, and self-responsibility. Early in the book the authors set their broad goals in terms of frequently quoted requirements for teachers: physical stamina, emotional stability, academic competence, social adaptability, civic capability, communication facility, intellectual versatility, and educative proficiency. On this broad base they build a philosophy of methods and demonstrate how these criteria can be applied to the specific field of physical education. The volume is calculated to broaden the outlook of the prospective teacher through a process of continuing self-appraisal and planning for improvement; yet, with all of its stress on "you, the teacher," and its emphasis on teaching methods and procedures, it does not lose sight of the child who rightfully is held as the central focus in each aspect of the educative process. In the view of the authors, physical education is a means to an end rather than an end in itself. It is one method of educating young people through appealing physical activities. In the educational setting its physical benefits are a concomitant outcome rather than the only goal of the program.

Surgery in Infancy and Childhood: A Handbook for Medical Students and General Practitioners. By Matthew White, M.A., M.B., Ch.B., and Wallace M. Dennison, M.D., F.R.F.P.S., F.R.C.S. Cloth. $9.50. Pp. 444, with 267 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2; E. & S. Livingstone, Ltd., 16 and 17 Teviot Place, Edinburgh 1, Scotland, 1958.

This book is dedicated to the nursing staff of the Royal Hospital for Sick Children in Glasgow, Scotland. The authors' purpose is to introduce to the senior medical student some of the surgical problems encountered in infancy and childhood. It is not intended as a reference book for pediatric or other surgeons. It is based, primarily, on a series of lectures and demonstrations. It is unfortunate that no bibliography was included. Line drawings, sketches, roentgenograms, and photographs (some in color) are well placed, well chosen, and informative. The subjects considered include surgery in infancy and childhood; preoperative care, anesthesia, and postoperative care; trauma; infection; bone; hemangioma and lymphangioma; the esophagus; the stomach; intestinal obstruction in the newborn infant, abdominal pain in infancy and childhood; intestine, colon, rectum, and anus; the umbilicus; testis and epididymis; hernia and hydrocele; liver and spleen; genitourinary system; the thorax; the head; face, mouth, and jaws; the neck; spine and pelvis; upper limbs, lower limbs, and paralysis in childhood. The succint discussion and supporting sketches on congenital cardiovascular anomalies are particularly commendable. The format and composition of the book are pleasing. This volume should be in the library of nursing schools and accessible to medical students, but it cannot compete with American textbooks on the same subject.

Orthopedic Diseases: Physiology—Pathology—Radiology. By Ernest Aegerter, M.D., Professor of Pathology and Director of Department of Pathology, Temple University Medical Center and School of Medicine, Philadelphia, and John A. Kirkpatrick, Jr., M.D., Radiologist, St. Christopher's Hospital for Children, Philadelphia. Cloth. $12.50. Pp. 602, with 354 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

This new volume is well written and brings a fresh viewpoint to many of the disease entities that are described. Each of its sections is practically a monograph. The first deals with connective tissue in general and includes a brief chapter on radiology of the skeletal system. Section 2 deals with disturbances in skeletal development. Each disease entity is described in general, then the roentgenographic manifestations, microscopic appearance, and prognosis are given. Section 3 discusses disturbances in the normally formed skeleton in a similar way, and section 4 is concerned with tumors. The book is excellently illustrated, and the authors are to be commended for the superior quality of these reproductions. This book is one of the best reference books on orthopedic diseases that has been published.

QUESTIONS AND ANSWERS

METASTATIC CARCINOMA OF THE RECTUM

To the Editor:—*Please give advice on treatment for metastases in the pelvis from carcinoma of rectum, the primary site in a 55-year-old woman. She had a colostomy 12 years ago, and function since then has been quite good. She has considerable pain in the low part of her back at present which is relieved by therapy with opium derivatives, chlorpromazine hydrochloride, and dextro propoxyphene hydrochloride. The pelvic metastases are minimal according to x-ray findings. The pain seems to be out of proportion to the severity of the metastases.*

G. C. Haskell, M.D., Springfield, Ohio.

Answer.—There is no satisfactory treatment for metastatic carcinoma of the rectum. It seems most unusual to have a carcinoma of the rectum recur after 12 years, and one wonders how the diagnosis of pelvic metastases was established. Reexploration may be indicated to determine the nature and extent of the recurrence of the disease. If the involved area can be identified, then local radiotherapy offers the best possibility of providing some relief, although this is admittedly a limited form of treatment. In the absence of more clinical information, a more detailed reply would be speculative. Generally speaking, however, there are no chemotherapeutic agents that have had an important effect on metastatic carcinoma of the large intestine.

Answer.—It is presumed that the metastases are to the bony pelvis and that the interval since treatment of the primary tumor is 12 years. It would be well to be cautious about the diagnosis and to keep in mind that a new disease may have occurred. Bone marrow studies might aid in the diagnosis. It would be well to use opiates sparingly, since the inquirer mentions that the metastases are minimal and, presumably, the patient's general condition is still good. X-ray therapy might be of help, and chemotherapeutic agents, such as triethylenethiophosphoramide, might be tried empirically. If such palliative treatment is unsuccessful, neurosurgical consultation should be requested.

UNILATERAL TEMPOROMANDIBULAR JOINT PAIN

To the Editor:—*A 30-year-old woman had a gradual onset of pain in the right temporomandibular joint one year ago which has been present ever since, occasionally becoming more severe. The other joint has never been involved, and she has no other symptoms associated with this pain. The pain is aggravated when she opens her mouth widely and sometimes by chewing. She states that sometimes there is swelling around the joint, but this has not been noticed by anyone else. The patient has never had any arthritis or other similar illnesses, and a complete physical examination revealed her to be in good physical condition otherwise. X-ray of the mandible and temporomandibular joint, done two months ago, showed a relaxation of the capsular ligament in both joints. No other abnormalities were noted. Please advise on diagnosis and treatment in this case.*

Ralph E. Thompson, M.D., Lebanon, Ore.

Answer.—It is assumed that the presence of any local disease about the temporomandibular joint has been excluded by adequate physical and roentgenographic examinations. Probably the most common cause of the symptoms complained of by this patient is malocclusion. Careful examination by a dental surgeon is indicated. It is not uncommon that patients who experience symptoms of this sort develop a habitual tic of moving the jaw in a peculiar and abnormal way. This serves to continue the irritation. The patient's jaw should be put at rest. The use of a soft diet, avoidance of opening the jaws widely and, if necessary, a chin sling to restrict motion may be tried.

Answer.—Although unilateral pain in the temporomandibular joint may relate to a number of causes, it will appear that in this instance the patient may be suffering from a muscular spasm. This can be determined by injecting procaine hydrochloride into the masseter muscle to determine if the pain disappears. If this does occur, one may be reasonably sure that the problem is not with the joint per se. By way of therapy, the patient should be advised to exercise the muscle by opening and closing the jaw to its maximum extent while the muscle has been anesthetized. If muscle spasm is her problem, this should bring relief.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

TREATMENT OF PIGMENTED NEVI

To the Editor:—*A 12-year-old patient has a number of pigmented nevi on the face and back. These are becoming more prominent and numerous. What would be the best treatment for facial pigmented nevi, with a cosmetic consideration?*

Donald F. McDonald, M.D., Seattle, Wash.

Answer.—With the child 12 years old, it would be preferable not to attempt to remove these nevi. Unless there are some tumors that are clinically premalignant (flat, black, smooth, and hairless) in areas of present or potential trauma (such as on the feet or under straps) there is little to be gained by eradicating them at this age. Recurrences are common in patients before or during adolescence unless complete excision is performed. If the lesions are eliminated by an elliptical excision and suturing, some scarring is to be expected and this may be greater and more disfiguring than anticipated. If the growths are ignored for the time being, many will become elevated and can then be shaved off even with the skin, and trichloroacetic acid can be applied to the bleeding base without producing scarring. Premalignant lesions can be excised and sutured at this age, since cosmetic results are less important here than considerations of future health and life. Chemical treatment of pigmented nevi is inadvisable, for histopathological study of such tumors is to be commended. All excised or shaved specimens should be subjected to microscopic examination. If junctional changes are found in lesions removed ultraconservatively (as by shaving), total postoperative excision should be considered. However, the presence of such alterations in the microscopic section is of less significance in the adolescent than it is in the mature person.

HERPES PROGENITALIS

To the Editor:—*What is the significance of the appearance of herpes simplex on the prepuce of an apparently healthy man, aged 45, and what, if any, treatment should be instituted? The herpes appears every three to four months, mostly on the right side, and seems not to have any connection to sexual activity.*

F. W. Gebhardt, M.D., Dupo, Ill.

Answer.—Herpes simplex occurring on the prepuce, commonly called herpes progenitalis, is caused by irritation or inflammation of the peripheral nerves or ganglionic centers which is induced by various agents. These agents may be local, as the accumulation of smegma. Bouts of mild inflammation may recur from a specific or nonspecific infection of Cowper's gland, the prostate, or any structure in the lower intestine. This reaction may be caused by bacterial agents or by certain foods. The condition in itself is not of major significance, but due to the production of breaks in the skin barrier it may provide a portal of entrance for a more significant infection. The methods of treatment are many, which is always evidence of a lack of having a specific. At the first signs of irritation local applications of hot compresses or immersion of the organ in hot boric acid solutions, followed by topical application of camphor in any of its usual forms, may be abortive. Injections of gamma globulin may hasten the disappearance of a developed lesion. Repeated smallpox vaccinations may also be used, both for prophylaxis and for treatment of the developed lesion. For the infected lesions tetracycline and vitamin B_{12} are useful. Benzoin tincture and the use of x-ray have been recommended. Circumsion may be recommended in certain cases.

PROGESTERONE AND ABORTION

To the Editor:—*Does progesterone have any adverse effect on the fetus in the case of a threatened abortion? If so, would such effect be temporary or permanent?*

Dale C. Hager, M.D., Beaumont, Texas.

Answer.—For many years progesterone has been known to have androgenic properties. Recent reports (Nellhaus, *New England J. Med.* 258:935, 1958; Jones, *Obst. & Gynec. Surv.* 12:433, 1957; Wilkins and Jones, *Obst. & Gynec.* 11:355, 1958) suggest that in the human being masculinization of the female fetus, with production of female pseudohermaphroditism, may be a direct result of the administration of progestational substances to the mother during pregnancy. Ideally, progesterone or allied hormones should be administered during pregnancy only in physiological amounts and only when there is demonstrated deficiency. But, since assay of these substances is not feasible in routine clinical practice, one is forced either to abandon progesterone therapy altogether in cases of threatened and habitual abortion, despite its probable usefulness in some cases, or to decide on a dose which may be helpful but is probably insufficient to cause masculinization if the fetus is a female. It is estimated that through the third month of pregnancy the endogenous production of progesterone averages from 30 to 50 mg. per 24 hours. An appropriate, and probably safe, dose would be of the order of 25 mg. daily or 50 mg. three times a week. In the present state of knowledge, the use of larger doses appears to be contraindicated. With respect to the permanency of this affection, data are as yet too meager to permit conclusion.

EFFECT OF VIBRATION ON PREGNANCY

To the Editor:—*A 39-year-old woman has been married eight years and has no living children. One previous pregnancy, in 1954, resulted in spontaneous abortion. After vigorous infertility treatment, another pregnancy of approximately eight weeks' duration now exists. Threatened abortion has been evident for a good portion of this time, but, with appropriate treatment, her condition now seems stabilized. There are considerable emotional problems, and insomnia is present. A vibrating bed seems to lull her to restful sleep. Is there any possible threat to pregnancy at any stage by the use of such vibration?*

Charles G. Freundlich, M.D., Houston, Texas.

Answer.—As far as is known there is no information available concerning the threat of vibration to pregnancy. Extremely mild vibrations probably have no ill-effects on gestation.

CLIMATE AND EMPHYSEMA

To the Editor:—*A patient, aged 55, has severe and disabling emphysema and bronchiectasis. How much benefit would he obtain by moving to an area with a drier climate, such as Arizona?*

M. W. Hook, M.D., Cheraw, S. C.

Answer.—Patients sometime benefit greatly by a change of climate, particularly if emphysema is related to asthma and if change of environment permits escape from exposure to allergens. On the other hand, some patients suffer from atmospheric dust in an arid climate and others become worse for no apparent reason. A patient should not be encouraged to make a great financial sacrifice to change climate unless a trial period of residence convinces him personally that the change is beneficial.

YEAST IN URINE

To the Editor:—*I would like to take exception to the statement made in answer in a question pertaining to the significance of the finding of yeast organisms in the urine (J. A. M. A. 167:142, [May 3] 1958). On many occasions yeast organisms may be seen to produce violent irritation and inflammation with resultant pyuria, dysuria, and symptoms of severe urinary disorder. The finding of yeast organisms in the urine has become magnified many fold during the past few years. Twenty-five or 30 years ago this finding was limited entirely to patients who had diabetes and in whom these organisms apparently had been introduced from without by catheterization or cystoscopic examination or by surgical and other procedures. With the advent of antibiotics and their effect in suppressing the organisms which apparently inhibit yeast growths, an increasing incidence of urinary tract infection has been observed in patients in whom the only organism that could be cultured or found on direct smear was that of yeast or various types of fungous formation. That these are not pathogenic is incorrect; in the practice of myself and my associates in the past few years no less than a dozen intractable infections were seen to be associated solely with yeast. Elimination of the yeast by modern methods, which has been extremely difficult, resulted in the clearing up of the urinary tract infection symptoms and a cure of the inflammatory reaction in the bladder and urethra. The widespread use of antibiotics apparently is giving the yeast an opportunity to become not only more prevalent but also more pathogenic. Whereas formerly only an occasional patient with monilial infection of the vagina would be seen for treatment, of the women who now come for treatment of urologic disorders fully 15 or 20% have either an asymptomatic yeast infection or one which is producing irritative symptoms. About 30 years ago a case of persistent urinary infection associated with the finding of yeast in the urine was so rare that it became the occasion for publication. At the present time, patients found with urinary tract infections, who have been treated with various antibiotics, finally have an infection with yeast and no other organism, and the yeast is more resistant to treatment than any of the bacilli or cocci.*

Vincent J. O'Conor, M.D.
720 N. Michigan Ave.
Chicago 11.

The above comment was referred to the consultant who answered the original query, and his reply follows.—Ed.

To the Editor:—*This consultant agrees that patients are prone to urinary complications due to the use and abuse of antibiotics. However, the question was answered merely on the basis of yeast cells in the patient's urine. No mention was made of the patient having received antibiotics, nor was there mention of whether the urine specimen examined was obtained by catheterization. It is heartily agreed that patients are seen with monilial infections as the result of antibiotic therapy in urinary tract infections. It is the custom in one particular hospital not to use any antibiotic for more than three days and only when it is indicated after a proper culture has been made and sensitivity studies done.*

GUIDES TO THE EVALUATION OF PERMANENT IMPAIRMENT

THE VISUAL SYSTEM

The Committee on Medical Rating of Physical Impairment

PREFACE

Evaluation or rating of permanent disability has long been recognized as an important and complex subject. In the past much confusion has resulted from inadequate understanding by physicians and others of (*a*) the scope of medical responsibility in evaluation of permanent disability; and (*b*) the difference between "permanent disability" and "permanent impairment."

It is vitally important for every physician to be aware of his proper role in the evaluation of permanent disability under any private or public program for the disabled. It is equally important for him to have the necessary authoritative material to assist him in competently fulfilling his particular responsibility—the evaluation of permanent impairment. It is the purpose of this and other reports by the Committee on Medical Rating of Physical Impairment to correct a past confusion of terms and to provide a series of practical guides to the evaluation of various types of permanent impairments.

The following explanations of generally used terms in programs for the disabled will suffice for all practical purposes:

1. *Permanent Disability.*—This is not a purely medical condition. A patient is "permanently disabled" or "under a permanent disability" when his actual or presumed ability to engage in gainful activity is reduced or absent because of "impairment" and no fundamental or marked change in the future can be expected.

2. *Permanent Impairment.*—This is a purely medical condition. Permanent impairment is any anatomic or functional abnormality or loss after maximal medical rehabilitation has been achieved and which abnormality or loss the physician considers stable or nonprogressive at the time evaluation is made. It is always a basic consideration in evaluation of permanent disability. It should be remembered, however, that permanent impairment is a contributing factor to, but not necessarily an indication of, the extent of a patient's permanent disability.

3. *Evaluation (Rating) of Permanent Disability.*—This is an administrative, not medical, responsibility and function. Evaluation of permanent disability is an appraisal of the patient's present and probable future ability to engage in gainful activity as it is affected by nonmedical factors, such as age, sex, education, and economic and social environment, and the medical factor—permanent impairment. Nonmedical factors have proved extremely difficult to measure. For this reason permanent impairment is, in fact, the sole or real criterion of permanent disability far more often than is readily acknowledged. A determination of permanent disability is an administrative decision as to the patient's entitlement.

4. *Evaluation (Rating) of Permanent Impairment.*—This is a function which physicians alone are competent to perform. Evaluation of permanent impairment defines the scope of medical responsibility and therefore represents the physician's role in the evaluation of permanent disability. Evaluation of permanent impairment is an appraisal of the nature and extent of the patient's illness or injury as it affects his personal efficiency in the activities of daily living. These activities are self-care, communication, normal living postures, ambulation, elevation, traveling, and nonspecialized hand activities. It is not and never can be the duty of physicians to evaluate the social and economic effects of permanent impairment. These effects must be evaluated by administrators in making determinations of permanent disability.

Competent evaluation of permanent impairment requires adequate and complete medical examination, accurate objective measurement of function, and avoidance of subjective impressions and nonmedical factors, such as the patient's age, sex, or employability.

The Committee on Medical Rating of Physical Impairment believes that permanent impairment cannot vary because of the circumstances of its occurrence or the geographical location of the patient at the time. Furthermore, unlike disability, permanent impairment can be measured with a reasonable degree of accuracy and uniformity on

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Members of the Committee on Medical Rating of Physical Impairment are Drs. Raymond M. McKeown, Chairman, Coos Bay, Ore.; George F. Gsell, Wichita, Kan.; Henry H. Kessler, Newark, N. J.; Quentin W. Mack, Boise, Idaho; James R. McVay, Kansas City, Mo.; and O. A. Sander, Milwaukee. Staff members are Mr. George W. Cooley, Secretary, Chicago; and Mrs. Marjorie W. Grigsby, Research Associate, Chicago.

Consultants in the preparation of this guide were Drs. Ralph W. Danielson, Denver; Charles E. Jaeckle, East Orange, N. J.; and Harold G. Scheie, Philadelphia.

the basis of impaired function as evidenced by loss of structural integrity, pathology, or pain substantiated by clinical findings.

The Committee is familiar with the various formulas developed in the past for use in evaluation of permanent disability. These formulas are usually administrative devices which equate specific medical criteria to specific percentages of permanent partial or total disability (loss of working or earning capacity). From the medical standpoint the medical criteria may undeniably represent various anatomic or functional impairments. However, it is unrealistic to presume that many of these impairments, especially those of a minor nature, will necessarily at some time result in disability. These administrative devices are not generally available to physicians and in any event would not be useful in making sound evaluations of permanent impairment.

On the other hand, although a number of valuable contributions have been made in the past, the Committee found no comprehensive practical system of the type necessary for the evaluation of permanent impairment by individual body systems or of the whole man. For this reason the Committee has undertaken to prepare a series of guides. The Committee has been greatly assisted in its work by the outstanding consultants whose names appear in connection with the appropriate guides.

Two guides are now available: the first, dealing with the extremities and back, was published as a special edition of the Feb. 15, 1958, issue of THE JOURNAL, and the second, concerned with the visual system, is introduced here.

Both guides have been developed after careful study of the literature and of the views of recognized authorities and will be reviewed periodically to insure their continuing value as advances in medical knowledge and technique occur.

Each guide contains recommended percentage values related to the criteria provided. The use of numerical values is preferred because of difficulty in communication and variability in interpretation of such terms as "slight," "marked," and "moderate." Such values provide a practical means of expressing and calculating the extent of permanent impairment and encourage accurate, equitable, and uniform evaluation.

Methods of calculating impairment are uniform, explained in detail with examples, and require a minimum of computation.

Generally, when a single impairment is involved the percentage value may be read directly from the text or transposed to a relative value of a unit of the body or of the whole man by referring to appropriate tables.

When two or more impairments are involved, however, the value of each impairment must be ascertained and transposed to a common denominator, such as the whole man. Thereafter these values must be combined. A combined values table is provided by which any combination of impairments may be easily found. The method generally employed to combine various impairments is based on the principle that each impairment acts not on the whole part but on the portion which remains after the preceding impairment has acted. For purposes of computation, the source and chronology of the impairment values is immaterial.

After the values of all impairments involved have been computed and transposed to a common denominator, the final impairment value, whether the result of single or combined impairments, is expressed in terms of the nearest 5%.

THE VISUAL SYSTEM

Introduction

The purpose of this guide is to provide physicians with criteria for use in evaluating permanent impairment of the visual system. It is adapted from a report prepared by a committee of the Council on Industrial Health in 1955 and entitled "Estimation of Loss of Visual Efficiency." That and previous reports of the American Medical Association have been the basis for rating under numerous programs for the disabled.

The visual system consists of the eyes, adnexa oculi, and the optic pathways. This guide seeks to provide a simplified method for determining permanent visual impairment and its effect on an individual's ability to perform the activities of daily living. Diminished visual ability is expressed as a percentage of impairment of the visual system. Diminished ability of the individual is expressed as a percentage of impairment of the "whole man."

Visual impairment in varying degrees occurs in the presence of a deviation from normal in one or more functions of the eye, including (1) corrected visual acuity for distance and near, (2) visual fields, and (3) ocular motility with absence of diplopia. Evaluation of visual impairment is based on these three functions. Although they are not all equally important, vision is imperfect without the coordinated function of all three.

Other ocular functions and disturbances are considered to the extent that they are reflected in one or more of the three coordinated functions. Such ocular functions include color perception, adaptation to light and dark, accommodation, and binocular vision. Such ocular disturbances include paresis of accommodation, iridoplegia, metamorphopsia, entropion, ectropion, epiphora, and lagophthalmos. To the extent that any ocular disturbance causes impairment not reflected in visual acuity, visual fields, or ocular motility without diplopia, it must be evaluated by the physician as to the degree of impairment and be combined with the impairment of the visual system as determined in the calculations which follow. In such circumstances the physician will be guided by the value relative to the measurable functions on which evaluation is based in this guide, as well as by the value assigned to other ocular impairments in the individual case. Deformities of the orbit and cosmetic defects which do not alter ocular function are not considered.

The following equipment is necessary to test the functions of the eyes:

1. Visual acuity test charts for (*a*) distance: for purposes of standardization the Snellen test chart with block letters or numbers, the illiterate E chart, or Landolt's broken-ring chart are desirable; (*b*) near: there are many such charts available, using a similar Snellen notation for inches or Jaeger print or point type notation.
2. A standard perimeter with radius of 330 mm. and a tangent screen.
3. Refraction equipment.

Criteria and Methods for Evaluation

Central Visual Acuity.—Illumination of the test chart should be at least 5 foot-candles (f.-c.), and the chart or reflecting surface should not be dirty or discolored from age. The test distances should be 20 ft. (6 m.) for distance and 14 in. (36 cm.) for near vision.

Central vision should be measured and recorded for distance and near with and without correction. The use of contact lenses might further improve vision reduced by irregular astigmatism from corneal injury or disease. However, the practical difficulties of fitting and expense and tolerance of such lenses, in addition to the fact that they are often medically contraindicated, are sufficiently important at present to recommend that only regular ophthalmic lenses be used to obtain the best corrected vision.

Visual acuity for distance should be recorded in the notation of a fraction in which (1) the "numerator" is the test distance in feet or meters; and (2) the "denominator" is the distance at which the smallest letter discriminated by the patient would subtend 5 minutes of arc (the distance at which an eye with 20/20 vision would see that letter).

This fractional designation is purely a convenient form of notation and does not imply percentage of visual acuity. A similar Snellen notation with use of inches or a comparable Jaeger or point-type notation may be used in designating visual acuity for near.

The visual acuity notations for distance and near with corresponding percentages of loss of central vision which appear in table 1 are included solely to indicate the basic values used in developing table 2.

Simple addition of two percentages of loss corresponding to appropriate notations for distance and near does not provide the true percentage loss of central vision. In accordance with accepted principles, true loss of central vision is the mean of the two percentages (table 2).

Monocular aphakia is considered an additional visual handicap and, if present, is assigned a value of 50% decrease in the remaining corrected central vision (table 2).

To Determine Loss of Central Vision in One Eye:

1. Measure and record central visual acuity for distance and near with and without corrective lenses.
2. Consult table 2 for corresponding loss of central vision depending on the presence of monocular aphakia.

TABLE 1.—*Central Visual Acuity Notations*

Distance		
Snellen		*Loss of Central*
English	*Metric*	*Vision, %*
20/16	6/5	0
20/20	6/6	0
20/25	6/7.5	5
20/32	6/10	10
20/40	6/12	15
20/50	6/15	25
20/64	6/20	35
20/80	6/24	40
20/100	6/30	50
20/125	6/38	60
20/160	6/48	70
20/200	6/60	80
20/300	6/90	85
20/400	6/120	90
20/800	6/240	95

Near

Snellen	*Jaeger*	*Point*	*Loss of Central Vision, %*
14/14	1–	3	0
14/18	2–	4	0
14/22	...	5	5
14/28	3	6	10
14/35	6	8	50
14/45	7–	9+	60
14/56	8	12	80
14/70	11	14	85
14/87	...	...	90
14/112	14	22	95
14/140	...	...	98

EXAMPLE.—Without allowance for monocular aphakia: 14/56 for near and 20/200 for distance produces 80% loss of central vision. With allowance for monocular aphakia (applicable to corrected vision only): 14/56 for near and 20/200 for distance produces 90% loss of central vision.

Visual Fields.—The extent of the visual field is determined by use of the usual perimetric methods with a white target which subtends a 0.5-degree angle (a 3-mm. white disk at a distance of 330 mm.) under illumination of not less than 7 f.-c. A 6/330 white disk should be used for aphakia. The

Table 2.—*Loss of Central Vision*[*]

Snellen Rating for *Distance*	Snellen Rating for *Near*										
	14/14	14/18	14/22	14/28	14/35	14/45	14/56	14/70	14/87	14/112	14/140
20/16	0 50	0 50	3 52	5 53	25 63	30 65	40 70	43 72	45 73	48 74	49 75
20/20	0 50	0 50	3 52	5 53	25 63	30 65	40 70	43 72	45 73	48 74	49 75
20/25	3 52	3 52	5 53	8 54	28 64	33 67	43 72	45 73	48 74	50 75	52 76
20/32	5 53	5 53	8 54	10 55	30 65	35 68	45 73	48 74	50 75	53 77	54 77
20/40	8 54	8 54	10 55	13 57	33 67	38 69	48 74	50 75	53 77	55 78	57 79
20/50	13 57	13 57	15 58	18 59	38 69	43 72	53 77	55 78	58 79	60 80	62 81
20/64	18 59	18 59	20 60	23 62	43 72	48 74	58 79	60 80	63 82	65 83	67 84
20/80	20 60	20 60	23 62	25 63	45 73	50 75	60 80	63 82	65 83	68 84	69 85
20/100	25 63	25 63	28 64	30 65	50 75	55 78	65 83	68 84	70 85	73 87	74 87
20/125	30 65	30 65	33 67	35 68	55 78	60 80	70 85	73 87	75 88	78 89	79 90
20/160	35 68	35 68	38 69	40 70	60 80	65 83	75 89	78 89	80 90	83 91	84 92
20/200	40 70	40 70	43 72	45 73	65 83	70 85	80 90	83 91	85 93	88 94	89 95
20/300	43 72	43 72	45 73	48 74	68 84	73 87	83 91	85 93	88 94	90 95	92 96
20/400	45 73	45 73	48 74	50 75	70 85	75 88	85 93	88 94	90 95	93 97	94 97
20/800	48 74	48 74	50 75	53 77	73 87	78 89	88 94	90 95	93 97	95 98	97 99

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[*] Upper figure=% loss of central vision without allowance for monocular aphakia; lower figure=% loss of central vision with allowance for monocular aphakia.

test object is brought from the periphery to the seeing area. At least two peripheral fields should be obtained which agree within 15 degrees in each meridian. The reliability of the patient's responses should be noted. The result is plotted on an ordinary visual field chart on each of the eight 45-degree principal meridians (fig. 1).

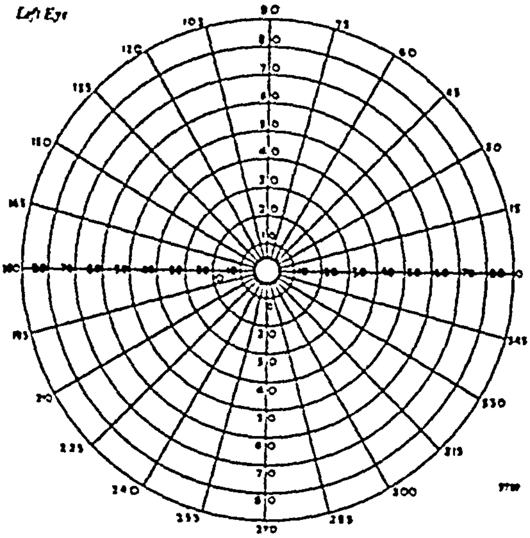

Figure 1

The minimum normal extent of the visual field from the point of fixation is indicated in table 3. These figures are somewhat less than the average normal, thus allowing for poor or delayed subjective responses or unusual prominence of brow or nose.

TABLE 3.—*Minimal Normal Extent of Visual Field from Point of Fixation*

	Degrees
Temporally	85
Down temporally	85
Down	65
Down nasally	50
Nasally	60
Up nasally	55
Up	45
Up temporally	55
Total	500

The percentage of retained visual field in one eye is obtained by adding the number of degrees of the eight principal meridians given in table 3 for the 3/330 white isopter, which normally is 500 degrees, and dividing by five. Conversely, the percentage loss of visual field is obtained by adding the degrees lost (as measured from the norms in table 3) in each of the eight principal meridians and dividing the total by five. Where there is a loss of a quadrant or a half field, it is necessary to add the total of the loss in each meridian to half the sum of the two boundary meridians. Visual field loss can be calculated for other defects in a similar manner.

Although the extent of visual field loss cannot be determined accurately for scotomas, an approximation can be obtained by subtracting the width of the scotoma from the peripheral visual field value at those same meridians. A similar estimation of visual field loss can be applied to enlargement of the blind spot with use of a 2-mm. test object at a distance of 1 m. from a tangent screen with the patient wearing his corrective lenses. For example, a general enlargement of the blind spot of 5 degrees would result in a visual field loss of $8 \times 5 \div 5 = 8\%$ loss. Because a central scotoma directly affects the central visual acuity, which is first evaluated, such visual field loss is not again used in the final calculation of visual loss.

To Determine Loss of Visual Field:

1. Plot the extent of visual fields in each of the eight 45-degree meridians on an ordinary visual field chart (fig. 1).

2. (*a*) Determine the degrees lost by adding the degrees of visual field lost in each of the principal meridians (table 3).

EXAMPLE.—A concentric contraction to 30 degrees.

Loss	Degrees
Temporally	55
Down temporally	55
Down	35
Down nasally	20
Nasally	30
Up nasally	25
Up	15
Up temporally	25
Total loss	260

TABLE 4.—*Loss of Visual Field*

Total Degrees		% of Loss	Total Degrees		% of Loss	Total Degrees		% of Loss
Lost	Retained		Lost	Retained		Lost	Retained	
0	500[*]	0	170	330	34	340	160	68
5	495	1	175	325	35	345	155	69
10	490	2	180	320	36	350	150	70
15	485	3	185	315	37	355	145	71
20	480	4	190	310	38	360	140	72
25	475	5	195	305	39	365	135	73
30	470	6	200	300	40	370	130	74
35	465	7	205	295	41	375	125	75
40	460	8	210	290	42	380	120	76
45	455	9	215	285	43	385	115	77
50	450	10	220	280	44	390	110	78
55	445	11	225	275	45	395	105	79
60	440	12	230	270	46	400	100	80
65	435	13	235	265	47	405	95	81
70	430	14	240	260	48	410	90	82
75	425	15	245	255	49	415	85	83
80	420	16	250	250	50	420	80	84
85	415	17	255	245	51	425	75	85
90	410	18	260	240	52	430	70	86
95	405	19	265	235	53	435	65	87
100	400	20	270	230	54	440	60	88
105	395	21	275	225	55	445	55	89
110	390	22	280	220	56	450	50	90
115	385	23	285	215	57	455	45	91
120	380	24	290	210	58	460	40	92
125	375	25	295	205	59	465	35	93
130	370	26	300	200	60	470	30	94
135	365	27	305	195	61	475	25	95
140	360	28	310	190	62	480	20	96
145	355	29	315	185	63	485	15	97
150	350	30	320	180	64	490	10	98
155	345	31	325	175	65	495	5	99
160	340	32	330	170	66	500	0	100
165	335	33	335	165	67			

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[*] Or more.

(*b*) If a half field is lost, add the degrees lost to half the sum of the two boundary meridians.

Example.—Entire temporal field lost.

Loss	Degrees
Up temporally	85
Temporally	85
Down temporally	55
Av. of up and down	55
Total loss	280

3. Consult table 4 to ascertain corresponding percentage loss of visual field.

Example.—Total loss of 260 degrees=52% loss of visual field.

Ocular Motility.—Unless diplopia is present within 30 degrees of the center of fixation, it rarely causes significant visual loss except on looking downward. The extent of the diplopia in the various directions of gaze is determined on the perimeter at 330 mm. or on any tangent screen at a distance of 1 m. from the patient in each of the 45-degree meridians, with use of a small test light and without the addition of colored lenses or correcting prisms.

To Determine Loss of Ocular Motility in One Eye:

1. Plot the results of the separation of two images on a visual field chart.

2. Add the corresponding percentage loss of ocular motility caused by diplopia in various positions of gaze as given in figure 2 below.

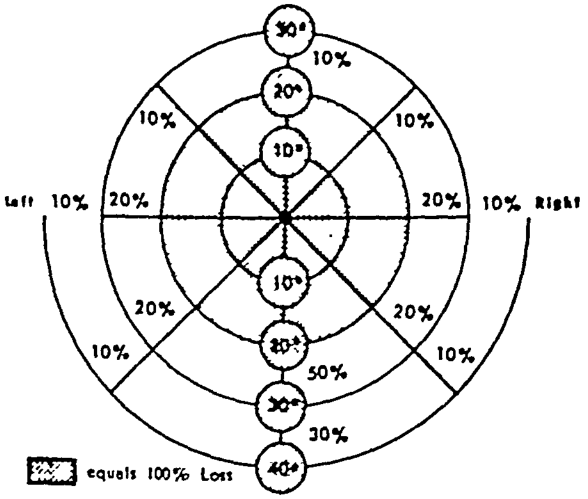

Fig. 2.—Percentage loss of ocular motility of one eye in diplopia fields.

Example.—Diplopia within the central 20 degrees=100% loss of ocular motility.

Example.—Diplopia on looking to the side from

20 to 30 degrees=20%	loss of ocular motility
30 to 40 degrees=10%	loss of ocular motility
30%	loss of ocular motility

To Determine Impairment of the Visual System:

1. Calculate separately and record for each eye.
   - (*a*) percentage loss of central vision (CV)
   - (*b*) percentage loss of visual field (VF)
   - (*c*) percentage loss of ocular motility (OM)

2. Using combined values table, combine percentage loss of central vision with percentage loss of visual field in each eye separately. Record these values.

Example.—Right eye—

loss of central vision	56%
loss of visual field	32%
(56 combined with 32=70)	70%

Left eye—

loss of central vision	46%
loss of visual field	32%
(42 combined with 32=63)	63%

3. Again using the combined values table, combine percentage loss of ocular motility in eye with greatest loss with combined value for central vision and visual field in that eye. Disregard loss of ocular motility in other eye.

Example.—Right eye—

combined value of CV and VF	70%
loss of ocular motility	25%
(70 combined with 25=78)	78%

4. Consult table 5 to ascertain impairment of the visual system.

Example.—Impairment of

right (worse) eye	78%
Impairment of left (better) eye	63%
Impairment of visual system	67%

Example.—Impairment of

right (worse) eye	90–100%
Impairment of left (better) eye	0%
Impairment of visual system	25%

Note.—Binocular aphakia is considered an additional visual handicap of 25% if evaluation has been based on corrected central vision. If, however, uncorrected central vision has been used in evaluation, allowance for aphakia has already been made.

5. Consult table 6 to ascertain impairment of whole man contributed by impairment of visual system.

Example.—67% impairment of visual system=63% impairment of whole man.

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TABLE 5—VISUAL SYSTEM °

The values in this table are based on the following formula:

$$\frac{3 \times \text{better eye value} + \text{worse eye value}}{4} = \text{impairment of visual system.}$$

The guides to the table are percentage impairment values for each eye. The percentage for the worse eye is read at the side of the table. The percentage for the better eye is read at the bottom of the table. At the intersection of the column for the worse eye and the column for the better eye is the impairment of visual system value.

For example, when there is 60% impairment of one eye and 30% impairment of the other eye, read down the side of the table until you come to the larger value (60%). Then follow across the row until it is intersected by the column headed by 30% at the bottom of the page. At the intersection of these two columns is printed the number 38. This number (38) represents the percentage impairment of the visual system when there is 60% impairment of one eye and 30% impairment of the other eye.

0	0																																																	
1	0	1																																																
2	1	1	2																																														
3	1	2	2	3																																													
4	1	2	3	3	4																																											
5	1	2	3	4	4	5																																										
6	2	2	3	4	5	5	6																																									
7	2	3	3	4	5	6	6	7																																								
8	2	3	4	4	5	6	7	7	8																																							
9	2	3	4	5	5	6	7	8	8	9																																						
10	3	3	4	5	6	6	7	8	9	9	10																																					
11	3	4	4	5	6	7	7	8	9	10	10	11																																				
12	3	4	5	5	6	7	8	8	9	10	11	11	12																																			
13	3	4	5	6	6	7	8	9	9	10	11	12	12	13																																		
14	4	4	5	6	7	7	8	9	10	10	11	12	13	13	14																																	
15	4	5	5	6	7	8	8	9	10	11	11	12	13	14	14	15																																
16	4	5	6	6	7	8	9	9	10	11	12	12	13	14	15	15	16																															
17	4	5	6	7	7	8	9	10	10	11	12	13	13	14	15	16	16	17																														
18	5	5	6	7	8	8	9	10	11	11	12	13	14	14	15	16	17	17	18																													
19	5	6	6	7	8	9	9	10	11	12	12	13	14	15	15	16	17	18	18	19																												
20	5	6	7	7	8	9	10	10	11	12	13	13	14	15	16	16	17	18	19	19	20																											
21	5	6	7	8	8	9	10	11	11	12	13	14	14	15	16	17	17	18	19	20	20	21																										
22	6	6	7	8	9	9	10	11	12	12	13	14	15	15	16	17	18	18	19	20	21	21	22																									
23	6	7	7	8	9	10	10	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23																								
24	6	7	8	8	9	10	11	11	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	24																							
25	6	7	8	9	9	10	11	12	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	24	24	25																						
26	7	7	8	9	10	10	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26																					
27	7	8	8	9	10	11	11	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27																				
28	7	8	9	9	10	11	12	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	24	24	25	26	27	27	28																			
29	7	8	9	10	10	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29																		
30	8	8	9	10	11	11	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30																	
31	8	9	9	10	11	12	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	24	24	25	26	27	27	28	29	30	30	31																
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33	8	9	10	11	11	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33														
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35	9	10	10	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35												
36	9	10	11	11	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36											
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39	10	11	11	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39								
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41	10	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41						
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44	11	12	13	13	14	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44			
45	11	12	13	14	14	15	16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	4		
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49	12	13	14	15	15	16	17	18	18	19	20	21	21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49

°If bilateral aphakia is present and corrected central vision has been used in evaluation, impairment of visual system is increased 25%.

14	14	15	16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29																													
14	15	15	16	17	18	18	19	20	21	21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47					
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14	15	16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51
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16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52
16	17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51	52	53
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16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53
17	17	18	19	20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51	52	53	53
17	18	18	19	20	21	21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54
17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54
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18	18	19	20	21	21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54	54
18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54	55
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19	20	21	21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54	54	55	56
19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54	55	55	56
20	20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51	52	53	53	54	55	56	56
20	21	21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54	54	55	56	57
20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54	55	55	56	57
20	21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51	52	53	53	54	55	56	56	57
21	21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54	54	55	56	57	57
21	22	22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54	55	55	56	57	58
21	22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51	52	53	53	54	55	56	56	57	58
21	22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54	54	55	56	57	57	58
22	22	23	24	5	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54	55	55	56	57	58	58
22	23	23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51	52	53	53	54	55	56	56	57	58	59
22	23	24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54	54	55	56	57	57	58	59
22	23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54	55	55	56	57	58	58	59
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23	24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51	52	53	53	54	55	56	56	57	58	59	59	60
24	24	25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54	54	55	56	57	57	58	59	60	60
24	25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54	55	55	56	57	58	58	59	60	61
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25	25	26	27	28	28	29	30	31	31	32	33	34	34	35	36	37	37	38	39	40	40	41	42	43	43	44	45	46	46	47	48	49	49	50	51	52	52	53	54	55	55	56	57	58	58	59	60	61	6
25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42	43	44	44	45	46	47	47	48	49	50	50	51	52	53	53	54	55	56	56	57	58	59	59	60	61	6
																				40	41	42	42	43	44	45	45	46	47	48	48	49	50	51	51	52	53	54	54	55	56	57	57	58	59	60	60	61	6

TABLE 5 (CONTINUED)

50	50																																																	
51	50	51																																																
52	51	51	52																																															
53	51	52	52	53																																														
54	51	52	53	53	54																																													
55	51	52	53	54	54	55																																												
56	52	52	53	54	55	55	56																																											
57	52	53	53	54	55	56	56	57																																										
58	52	53	54	54	55	56	57	57	58																																									
59	52	53	54	55	55	56	57	58	58	59																																								
60	53	53	54	55	56	56	57	58	59	59	60																																							
61	53	54	54	55	56	57	57	58	59	60	60	61																																						
62	53	54	55	55	56	57	58	58	59	60	61	61	62																																					
63	53	54	55	56	56	57	58	59	59	60	61	62	62	63																																				
64	54	54	55	56	57	57	58	59	60	60	61	62	63	63	64																																			
65	54	55	55	56	57	58	58	59	60	61	61	62	63	64	64	65																																		
66	54	55	56	56	57	58	59	59	60	61	62	62	63	64	65	65	66																																	
67	54	55	56	57	57	58	59	60	60	61	62	63	63	64	65	66	66	67																																
68	55	55	56	57	58	58	59	60	61	61	62	63	64	64	65	66	67	67	68																															
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70	55	56	57	57	58	59	60	60	61	62	63	63	64	65	66	66	67	68	69	69	70																													
71	55	56	57	58	58	59	60	61	61	62	63	64	64	65	66	67	67	68	69	70	70	71																												
72	56	56	57	58	59	59	60	61	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72																											
73	56	57	57	58	59	60	60	61	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73																										
74	56	57	58	58	59	60	61	61	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74																									
75	56	57	58	59	59	60	61	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75																								
76	57	57	58	59	60	60	61	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73	74	75	75	76																							
77	57	58	58	59	60	61	61	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74	75	76	76	77																						
78	57	58	59	59	60	61	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75	76	77	77	78																					
79	57	58	59	60	60	61	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73	74	75	75	76	77	78	78	79																				
80	58	58	59	60	61	61	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74	75	76	76	77	78	79	79	80																			
81	58	59	59	60	61	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75	76	77	77	78	79	80	80	81																		
82	58	59	60	60	61	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73	74	75	75	76	77	78	78	79	80	81	81	82																	
83	58	59	60	61	61	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74	75	76	76	77	78	79	79	80	81	82	82	83																
84	59	59	60	61	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75	76	77	77	78	79	80	80	81	82	83	83	84															
85	59	60	60	61	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73	74	75	75	76	77	78	78	79	80	81	81	82	83	84	84	85														
86	59	60	61	61	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74	75	76	76	77	78	79	79	80	81	82	82	83	84	85	85	86													
87	59	60	61	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75	76	77	77	78	79	80	80	81	82	83	83	84	85	86	86	87												
88	60	60	61	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73	74	75	75	76	77	78	78	79	80	81	81	82	83	84	84	85	86	87	87	88											
89	60	61	61	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74	75	76	76	77	78	79	79	80	81	82	82	83	84	85	85	86	87	88	88	89										
90	60	61	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75	76	77	77	78	79	80	80	81	82	83	83	84	85	86	86	87	88	89	89	90									
91	60	61	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73	74	75	75	76	77	78	78	79	80	81	81	82	83	84	84	85	86	87	87	88	89	90	90	91								
92	61	61	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74	75	76	76	77	78	79	79	80	81	82	82	83	84	85	85	86	87	88	88	89	90	91	91	92							
93	61	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75	76	77	77	78	79	80	80	81	82	83	83	84	85	86	86	87	88	89	89	90	91	92	92	93						
94	61	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73	74	75	75	76	77	78	78	79	80	81	81	82	83	84	84	85	86	87	87	88	89	90	90	91	92	93	93	94					
95	61	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74	75	76	76	77	78	79	79	80	81	82	82	83	84	85	85	86	87	88	88	89	90	91	91	92	93	94	94	95				
96	62	62	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75	76	77	77	78	79	80	80	81	82	83	83	84	85	86	86	87	88	89	89	90	91	92	92	93	94	95	95	96			
97	62	63	63	64	65	66	66	67	68	69	69	70	71	72	72	73	74	75	75	76	77	78	78	79	80	81	81	82	83	84	84	85	86	87	87	88	89	90	90	91	92	93	93	94	95	96	96	97		
98	62	63	64	64	65	66	67	67	68	69	70	70	71	72	73	73	74	75	76	76	77	78	79	79	80	81	82	82	83	84	85	85	86	87	88	88	89	90	91	91	92	93	94	94	95	96	97	97	98	
99	63	63	64	65	65	66	67	68	68	69	70	71	71	72	73	74	74	75	76	77	77	78	79	80	80	81	82	83	83	84	85	86	86	87	88	89	89	90	91	92	92	93	94	95	95	96	97	98	98	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 6.—*The Visual System*

Impairment of		Impairment of		Impairment of	
Visual System, %	Whole Man, %	Visual System, %	Whole Man, %	Visual System, %	Whole Man, %
0	0	30	28	60	57
1	1	31	29	61	58
2	2	32	30	62	59
3	3	33	31	63	59
4	4	34	32	64	60
5	5	35	33	65	61
6	6	36	34	66	62
7	7	37	35	67	63
8	8	38	36	68	64
9	8	39	37	69	65
10	9	40	38	70	66
11	10	41	39	71	67
12	11	42	40	72	68
13	12	43	41	73	69
14	13	44	42	74	70
15	14	45	42	75	71
16	15	46	43	76	72
17	16	47	44	77	73
18	17	48	45	78	74
19	18	49	46	79	75
20	19	50	47	80	76
21	20	51	48	81	76
22	21	52	49	82	77
23	22	53	50	83	78
24	23	54	51	84	79
25	24	55	52	85	80
26	25	56	53	86	81
27	25	57	54	87	82
28	26	58	55	88	83
29	27	59	56	89	84
				90-100	85

COMBINED VALUES TABLE

These combined values are based on the formula: A% + B% (100% — A%) = combined value of A% and B%. The guides to the table are percents ranging from 1 to 100 printed down the side of the page, and across the bottom. To combine any two values locate the larger of the two on the side of the page and read along that row until you come to the column indicated by the second value at the bottom of the page. At the intersection of this row and column is printed the combined value. For example, to combine 35% and 20% read down the side of the page until you come to the larger value, 35%. Then read across the row you have located until you come to the column indicated by 20% at the bottom of the page. At the intersection of this row and column is the number 48. We say that 35% and 20% combine to 48%. Due to the construction of this table, the larger value must be read at the side of the page.

If three or more values are to be combined, select any two and find their combined value as above. Take this combined value and the third value and find their combined value. This process can be repeated indefinitely with the value obtained in each case being the combination of all the previous values.

1	2																																																	
2	3	4																																																
3	4	5	6																																															
4	5	6	7	8																																														
5	6	7	8	9	10																																													
6	7	8	9	10	11	12																																												
7	8	9	10	11	12	13	14																																											
8	9	10	11	12	13	14	14	15																																										
9	10	11	12	13	14	14	15	16	17																																									
10	11	12	13	14	14	15	16	17	18	19																																								
11	12	13	14	15	15	16	17	18	19	20	21																																							
12	13	14	15	16	16	17	18	19	20	21	22	23																																						
13	14	15	16	16	17	18	19	20	21	22	23	23	24																																					
14	15	16	17	17	18	19	20	21	22	23	23	24	25	26																																				
15	16	17	18	18	19	20	21	22	23	24	24	25	26	27	28																																			
16	17	18	19	19	20	21	22	23	24	24	25	26	27	28	29	29																																		
17	18	19	19	20	21	22	23	24	24	25	26	27	28	29	29	30	31																																	
18	19	20	20	21	22	23	24	25	25	26	27	28	29	29	30	31	32	33																																
19	20	21	21	22	23	24	25	25	26	27	28	29	30	30	31	32	33	34	34																															
20	21	22	22	23	24	25	26	26	27	28	29	30	30	31	32	33	34	34	35	36																														
21	22	23	23	24	25	26	27	27	28	29	30	30	31	32	33	34	34	35	36	37	38																													
22	23	24	24	25	26	27	27	28	29	30	31	31	32	33	34	34	35	36	37	38	38	39																												
23	24	25	25	26	27	28	28	29	30	31	31	32	33	34	35	35	36	37	38	38	39	40	40																											
24	25	26	26	27	28	29	29	30	31	32	32	33	34	35	35	36	37	38	38	39	40	41	41	42																										
25	26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44																									
26	27	27	28	29	30	30	31	32	33	33	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45																								
27	28	28	29	30	31	31	32	33	34	34	35	36	36	37	38	39	39	40	41	42	42	43	44	45	45	46	47																							
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COMBINED VALUES TABLE *(Continued)*

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WASHINGTON NEWS

FROM THE WASHINGTON OFFICE OF THE AMERICAN MEDICAL ASSOCIATION

U. S. Offers Maximum Public Aid Payments to 19 States . .

Social Security Reports Rise in Disability Appeals . .

Proposed Ban on Airmailing of Etiological Agents Dropped . .

American Legion Proposes VA Operate 125,000 Hospital Beds . .

NINETEEN STATES GET MAXIMUM FEDERAL AID UNDER PUBLIC ASSISTANCE

Nineteen states will be offered the maximum U. S. contribution and 19 held to the minimum under a new public assistance program that went into effect on Oct. 1. Public assistance systems are of concern to medicine because a growing percentage of this money goes for medical care. It is estimated that once the new arrangements are well under way possibly as much as half a billion dollars annually (state and U. S. funds) will go for the medical care of public assistance cases.

The federal government contributes to the support of four categories: needy aged, dependent children, disabled, and blind. Persons who are in need of public assistance, but do not fit into these categories, are the responsibility of the state or local community.

Until the new law took effect, the U. S. made an effort to earmark money intended for medical care, separating it from funds for housing, clothing, food, and other expenses. Now all the money is lumped together, and the states may use whatever part they wish for medical care and may handle the medical care money in any way they choose.

Under the new plan, the U. S. offers to pay $24 of the first $30 monthly for adults, and $14 of the first $17 for children. Then the states are offered between 50 and 65% of the remainder of the payments up to an average of $65 per month for adults and $30 for children, with states of relatively low per capita income receiving a higher percentage.

The 19 states whose per capita income is above the national average, thereby restricting them to 50%, are California, Connecticut, Delaware, District of Columbia, Illinois, Indiana, Maryland, Massachusetts, Michigan, Nevada, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Washington, Wyoming, Alaska, and Hawaii.

States with lowest incomes, therefore entitled to a 65% U. S. contribution, are Alabama, Arkansas, Georgia, Idaho, Kentucky, Louisiana, Maine, Mississippi, New Mexico, North Carolina, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, and West Virginia.

States in the middle group, and their approximate percentages, are Arizona, 63; Colorado, 53; Florida, 59; Iowa, 63; Kansas, 60; Minnesota, 58; Missouri, 53; Montana, 54; Nebraska, 63; New Hampshire, 57; Oregon, 52; Texas, 61; and Wisconsin, 54.

DISABILITY APPEALS INCREASING, SOCIAL SECURITY AGENCY REPORTS

The Social Security Administration is getting a rising volume of appeals from persons whose claims for social security benefits have been turned down by the Bureau of Old Age and Survivors Insurance. The step-up is due largely to appeals under the disability payments at age 50 voted by Congress two years ago.

As a result, the SSA staff of referees has been increased almost fourfold in the last two years, according to the agency. The heavy volume of disability claims and appeals is expected to continue through next year. On top of that, the 1958 amendments which make dependents of disabled insured workers eligible for payments will further swell the rate starting in six or eight months.

The 1956 amendments provide OASI payments to disabled workers between 50 and 65 if their disability is expected to continue indefinitely and is sufficiently severe to prevent them from doing any substantial work. According to Acting Social Security Commissioner William Mitchell, many applicants believe that, if their impairments keep them from working at their usual jobs, they are entitled to disability benefits under the social security program.

"The main test under the statute is not what kind of work a disabled person can do but whether he can do a substantial amount of work of any kind," Mr. Mitchell said in a statement. "Many applicants have impairments that entitle them to pensions or other compensations under other programs, and this leads them to believe that on that account they are also entitled to disability benefits under the social

(Continued on next page)

responses produced in the original target organ by direct hormonal stimulation (fig. 1). The anterior lobe of the pituitary gland is considered to master the other glands of the endocrine system. Even though the influences of the hypothalamus on the pituitary are not fully understood, it is presently believed that certain neurosecretions are released from the hypothalamus into the hypophysial portal system to aid in regulating the secretory activity of the anterior lobe cells.

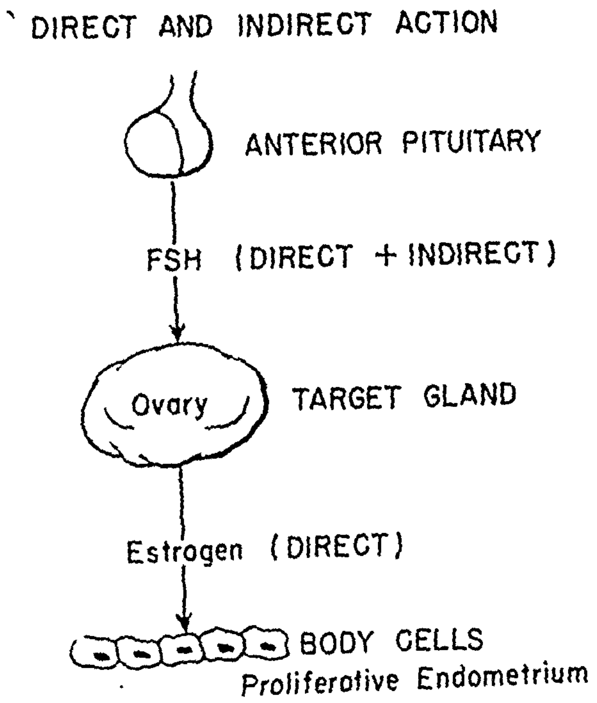

Fig. 1.—Action of hormones by direct and indirect stimulation.

The pituitary hormones that possess predominantly gynecologic influences are the gonadotropic hormones, follicle-stimulating hormone (FSH), luteinizing hormone (LH or ICSH), and prolactin (luteotropic hormone or LTH). The anterior pituitary, with respect to its gonadotropic hormones, acts directly on the ovary and only indirectly on other body cells. For example, when the ovary is absent, the pituitary gonadotropic hormones exert no effect on the endometrium. In the follicular phase of the normal menstrual cycle (fig. 2A), the anterior pituitary elaborates FSH, which in turn causes marked growth of the ovarian follicle and proliferation of the granulosa cells. At this time, in the presence of small amounts of LH, estrogen is secreted which then acts on the uterus to produce two changes: proliferation of the endometrium and growth of the uterus. The continued elaboration of estrogen results in depression of pituitary FSH output coupled with activation of the pituitary to secrete LH and prolactin (fig. 2B). LH acts synergistically with FSH, resulting in ovulation. After ovulation the ovary responds to the stimulus of LH with the formation of the corpus luteum (fig. 2C), from which LH initiates and LTH maintains secretion of progesterone. The primary effect of progesterone is production of secretory changes in the endometrium. In addition to bringing about these uterine changes, progesterone also depresses the pituitary output of LH and prolactin, thus completing the cycle of pituitary-ovarian interrelationships.

Hormones may also act conditionally. In other words, some hormones act only under the condition that a prior action has occurred. For example, progesterone can act only after an estrogen effect has been produced. Therefore, it is impossible to produce a secretory endometrium by administration of progesterone unless the endometrium has already been proliferated by endogenous or exogenous (administered) estrogen. In like manner, prolactin acts on the lactogenic structure of the breasts to effect milk secretion only if estrogen and progesterone have developed adequate ductal and alveolar tissue for functional activity.

Clinical Application

The availability of newer and more effective hormones now makes possible an increasingly practical clinical application of these preparations to obstetric and gynecologic practice. As shown in figure 3A, when an effective exogenous steroid hormone is administered orally or parenterally, even in large dosage, little or no direct effect is produced on the gland from which the hormone is elaborated. Estrogen, for example, does not produce a direct action on the ovary; any alteration in the ovarian function is produced indirectly, through the pituitary. How

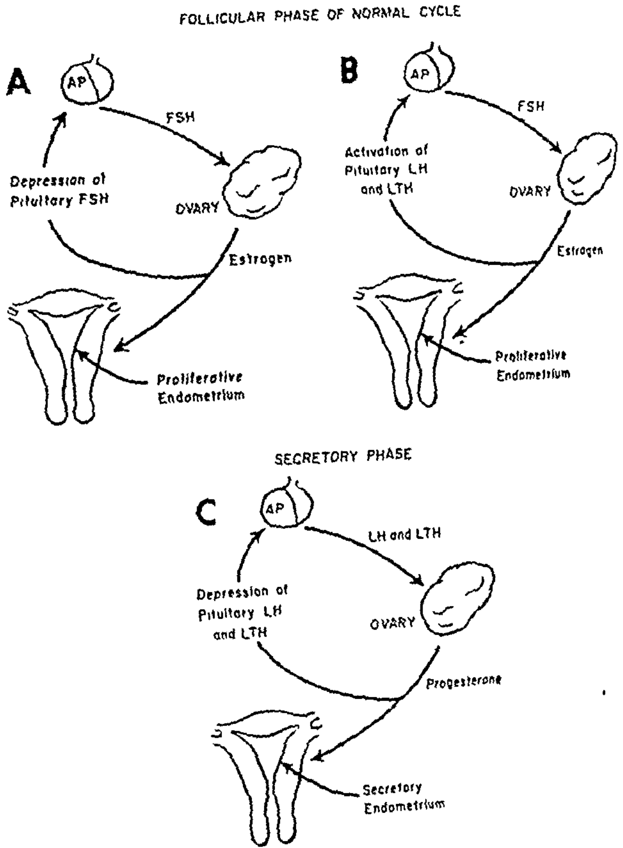
FOLLICULAR PHASE OF NORMAL CYCLE
A
AP
FSH
Depression of Pituitary FSH
OVARY
Estrogen
Proliferative Endometrium
B
AP
FSH
Activation of Pituitary LH and LTH
OVARY
Estrogen
Proliferative Endometrium
SECRETORY PHASE
C
AP
LH and LTH
Depression of Pituitary LH and LTH
OVARY
Progesterone
Secretory Endometrium

Fig. 2.—Mechanisms of production and effectiveness of ovarian steroids.

ever, exogenous estrogen does produce inhibition of the pituitary output of FSH and does stimulate body cells, such as endometrium and breast, in the same manner as does estrogen produced physiologically.

There are some clinical conditions in which the pituitary is functionally or anatomically obliterated; the effects of such pituitary ablation are shown in figure 4A. Obviously, no pituitary hormones are elaborated. Hypophysectomy is employed by some in an attempt to inhibit the growth of certain types of advanced malignancy. Functional pituitary obliteration exists in sex infantilism with obesity (Fröhlich's syndrome) caused by hypothalamic hypopituitarism. It also occurs when this organ is damaged by such processes as atrophy, embolism, thrombosis, infarction, and neoplasm or in such conditions as hypopituitary cachexia (Simmond's disease) or Sheehan's syndrome. As a result, no gonadotropin is elaborated from the pituitary to stimulate the ovary to secrete its steroid hormones; consequently, not only does the endometrium atrophy but the uterus decreases in size and menstruation ceases.

Theoretically, the administration of a tropic hormone (fig. 3*B*) produces a response similar to that produced by the intact pituitary. Even though purified preparations of FSH, LH, and prolactin are available and are effective in animal experimentation, no satisfactory or sufficiently potent pituitary gonadotropin is available in adequate amounts to effect clinical response. Thus, we have no preparations available for the direct stimulation of human ovulation. However, some effective tropic hormones are available for exogenous use but are of value for the stimulation of other target glands. Corticotropin, for instance, stimulates its target gland, the adrenal cortex, which responds by secreting hydrocortisone. Hydrocortisone then acts on the body cell directly, but the administered corticotropin also acts indirectly, through the elaboration of hydrocortisone, on the anterior pituitary to suppress the output of additional endogenous corticotropin.

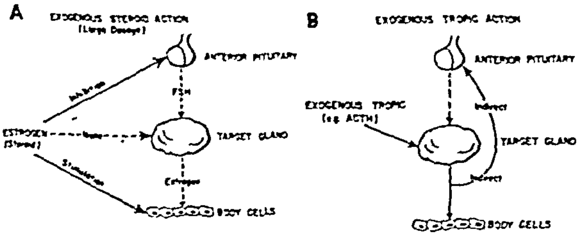

Fig. 3.—Effects of exogenous steroid and tropic hormones.

Endocrinous Disorders

One of the commonest causes of menstrual disorders is ovarian deficiency, due to either functional or anatomic obliteration of the ovary. Figure 4*B* illustrates the pattern of ovarian deficiency characteristic of the menopause. The ovary ceases to respond to stimulation. The reduction or absence of circulating ovarian steroids removes the normal brake on the pituitary, permitting excessive amounts of gonadotropic hormone, especially FSH, to be secreted. Since the ovary is unable to elaborate estrogen and progesterone, menstruation ceases and the uterus atrophies. Hormonal therapy can and should logically be directed at replacement of the target gland's hormone, in this instance, estrogen. Even though estrogen may be highly satisfactory in regulating chemical, physiological, and psychological homeostasis, restoration of ovarian function with respect to ovulation is not possible.

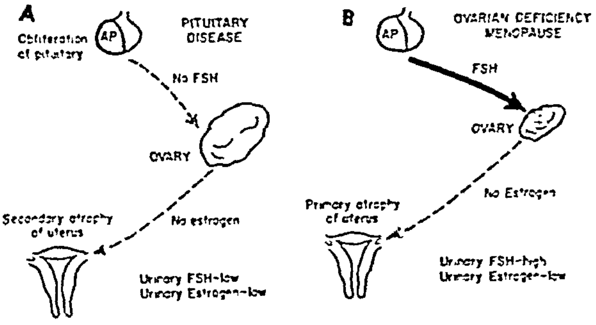

Fig. 4.—Functional or anatomic obliteration of hormone-producing organs.

Amenorrhea is probably the most common complaint met in gynecologic practice. It is not a diagnosis but should always be considered as a symptom of some underlying disease or alteration in normal physiology. It is a common symptom of hypothyroidism and a not infrequent finding in adrenal cortical hypofunction (Addison's disease). When the hypothyroidism is due to primary failure of the thyroid and the adrenal cortical hypofunction to adrenal cortical failure, the anterior pituitary reacts by secreting excessive amounts of thyrotropin and corticotropin in an attempt to stimulate the respective refractory target gland. It is possible that the pituitary secretes these tropic hormones at the expense of the gonadotropic hormones, resulting secondarily in inadequate stimulation of the ovary and therefore deficient ovarian hormone (estrogen) secretion, with resultant menstrual disturbances. In such patients, specific replacement with hormones, such as desiccated thyroid or cortisone derivatives, may be corrective. If specific replacement therapy is adequate, the menstrual dysfunction frequently is "cured" without the use of female sex hormones.

The adrenal gland is responsible for certain other endocrinous abnormalities in gynecology. Amenorrhea is one of the early symptoms in patients with adrenal cortical hyperfunction (Cushing's syndrome) or in patients with the adrenogenital syndrome; either of these may be caused by adrenal cortical hyperplasia, by a benign functioning adenoma, or by carcinoma. The knowledge and understanding of the etiology of the adrenogenital syndrome with virilization due to congenital adrenal hyperplasia have been greatly expanded in recent years. Not only has much been learned about the congenital form, but our understanding of the adult, acquired type of the syndrome has also been greatly enhanced. In the congenital form, an "inborn error of metabolism," the basic defect is in the synthesis of hydrocortisone, primarily due to an enzymatic block in the conversion of 17α-hydroxyprogesterone to hydrocortisone in the adrenal cortex. Levels of plasma and urinary glucocorticoids are usually decreased, while those of the 17-ketosteroids are markedly elevated. Diagnostic of the condition is the presence in the urine of a metabolite of 17α-hydroxyprogesterone, pregnanetriol, which accumulates in large amounts. Increased excretion of another metabolite, pregnanetriolone, recently has been reported by Cox and Finkelstein to be even more specifically diagnostic of hyperplasia than pregnanetriol.

The current concept of hormonal interrelationships in congenital adrenal hyperplasia is diagrammed in figure 5A. Since the zona fasciculata does not respond, adequate hydrocortisone is not produced, control of pituitary secretion is not regulated, and corticotropin (ACTH) is secreted in excessive amounts. The adrenal responds in the only way it can; the zona reticularis responds to the increased stimulus of ACTH by secreting large amounts of androgens, as well as some estrogens. These steroids depress the pituitary output of FSH, with resultant reduction of stimulation of the ovary, absence of ovarian estrogen, atrophy of the uterus, and amenorrhea. When such a patient is treated with cortisone or similar compounds, the output of pituitary corticotropin is inhibited, resulting in decreased secretion of androgens by the adrenal, resumption of a normal pattern of FSH output, and estrogen-induced proliferation of the endometrium. If cortisone treatment is continued (*fig. 5B*), the changes that occur might be summarized as follows: reduction in function, and probably size, of the zona reticularis of the adrenal cortex, decreased androgen secretion, resumption of normal secretion of FSH, secretion of LH to assist in ovulation and of prolactin to establish secretion by the corpus luteum, elaboration of estrogen and progesterone to stimulate growth of the uterus and breast to produce changes in cornification of the vaginal epithelium, decreased hirsutism, increased pitch of the voice, biphasic temperature curve, proliferative and secretory development of the endometrium, and, in three of our patients, pregnancy. One of these patients recently spontaneously delivered a normal living infant at term, which survived; this was the first patient, to our knowledge, to do so. This will be the subject of a detailed report in the future.

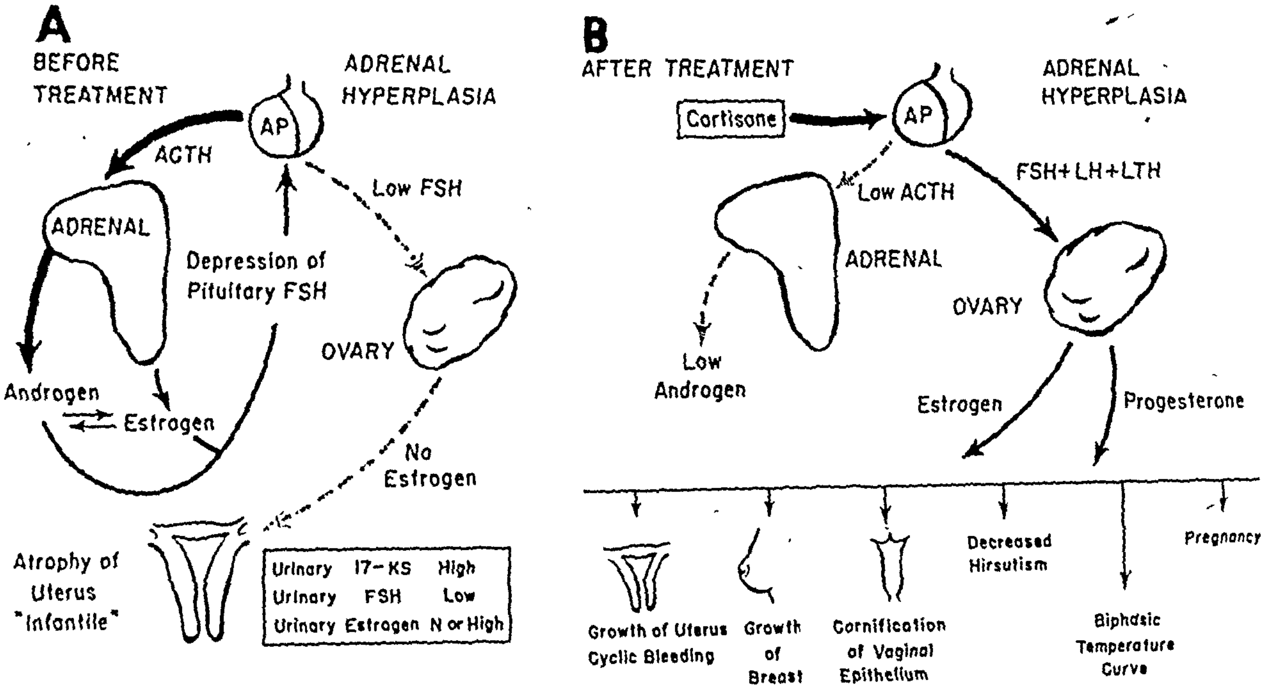

Fig. 5.—Mechanisms of loss and restoration of homeostasis in adrenal hyperplasia.

Effects of Estrogen and Progesterone

The end-effects of estrogen are well known. Uterine growth may occur as a result of the actual growth of each muscle cell of the uterus, of the growth of each connective tissue cell, and of endometrial proliferation. One of the first known effects of estrogen was vaginal cornification, initially demonstrated in the experimental animal and now shown by cytological techniques to exist in the estrogen-treated woman. Another estrogen effect is proliferation of the mammary ducts which promotes growth of the breast. Estrogen inhibits the output of pituitary follicle-stimulating hormone, a property useful for assessing treatment of the menopausal syndrome.

Estrogen also possesses certain important metabolic effects, the principal one of which is the retention of water and electrolytes, including sodium, potassium, and chloride. It would thus seem a bit paradoxical to advocate its use in the treatment of such syndromes as premenstrual edema, toxemia of pregnancy, or the edema present in certain types of arthritis. Estrogens also promote retention of calcium, phosphorus, and nitrogen. Though less effective than androgens in promoting nitrogen retention, estrogens are more effective in promoting calcium and phosphorus retention. Estrogens are frequently utilized for this anabolic action, either alone or in conjunction with androgens, and are often helpful in the treatment of osteoporosis in women after menopause and of metastatic bone carcinoma.

Effects of progesterone generally depend on the condition that estrogen has acted on the cell previously. The necessity for prior proliferative action of estrogen, either endogenous or administered, becomes applicable when prescribing treatment for functional uterine bleeding. It should also be clear that administration of progesterone would be valueless in the presence of an atrophic uterine endometrium. If proliferative endometrium is present at the time of, or just before, the onset of bleeding, then progesterone should produce satisfactory physiological endocrinous alterations and thus control uterine bleeding problems not due to malignancy, benign tumors, or pregnancy. By simulating normal physiology and probably by its effects on the pituitary, exogenous progesterone therapy may initiate ovulation in women with previously anovular cycles. Progesterone maintains elevation of the basal body temperature and inhibits the luteinizing and luteotropic hormones of the anterior pituitary.

Progesterone also inhibits contraction of the myometrium, at least in animals and in vitro, though this effect of the hormone has not been proved to be of clinical value. For example, progesterone therapy has been of little or no value in the management of threatened abortion and probably is of no value in habitual abortion. Progesterone develops the alveoli of the breast but, as with other tissues, only after previous conditioning action by estrogen to bring about adequate proliferation and development of ducts. Progesterone in large amounts has an anesthetic action; this effect may contribute to the excessive sleepiness sometimes seen in women during pregnancy when large amounts of progesterone are being secreted. Recently Landau has shown that progesterone has certain metabolic effects. These effects are essentially catabolic, in contrast to the anabolic effects of estrogen. Progesterone causes increased urinary nitrogen, phosphorus, sodium, and chloride excretion (or decreased retention of these elements).

Estrogen and progesterone have practical applications in the treatment of certain gynecologic disorders. Figure 6*A* illustrates the situation in the normal ovulatory cycle. At the end of the cycle, the concentration of circulating estrogen is reduced approximately 50% and progesterone disappears, whereupon menstrual bleeding occurs after a few days. In amenorrhea due to failing ovarian function with insufficient estrogen secretion, treatment with an estrogen preparation for three or four weeks will cause proliferation of the endometrium and withdrawal of estrogen or reduction of dosage by at least 50% will usually result in withdrawal bleeding (fig. 6*B* and *C*). If endogenous estrogen secretion is adequate, as determined by endometrial biopsy or vaginal cytology, treatment with progesterone for 10 days, followed by withdrawal, usually results in bleeding in 3 to 4 days. Under these circumstances, bleeding occurs from a secretory endometrium and the attempt is made to duplicate the hormonal relationships of a normal ovulatory cycle (fig. 6*A*).

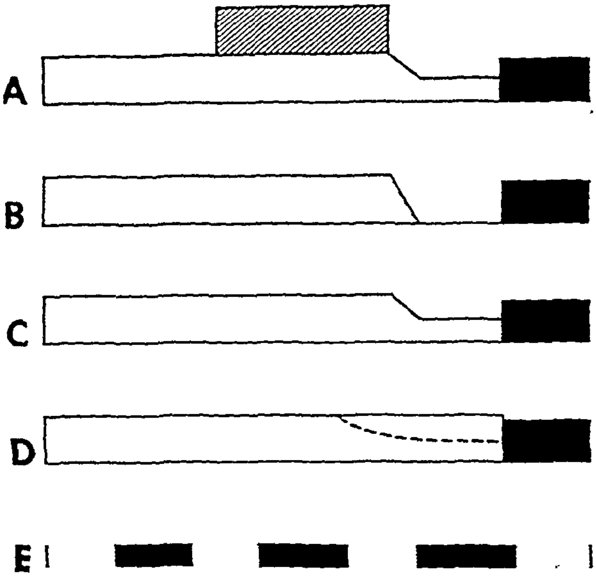

Fig. 6.—Patterns of ovarian steroid therapy: *A*, estrogen reduction and progesterone withdrawal (normal cycle); *B*, estrogen withdrawal; *C*, estrogen reduction; *D*, administered estrogen reduced in effectiveness after prolonged administration; *E*, estrogen dosage at threshold level, resulting in intermittent bleeding.

When estrogen is given continuously for an indefinite time (fig. 6*D*) or in constant, insufficient amounts (fig. 6*E*), a reduction in effectiveness occurs and the subsequent bleeding will be irregular in type, frequency, and amount. Bleeding under these circumstances closely resembles that of "functional uterine bleeding." In these cases estrogen may be administered for a short time at a higher dosage to build up the endometrium and bring about hemostasis, followed by progesterone for 10 days to bring about secretory changes; at this time progesterone is withdrawn. Repetition of this program for several consecutive cycles frequently brings about reestablishment of the spontaneous normal cyclic menstrual pattern.

Synthetic Preparations

Synthetic preparations possessing estrogenic and progestational activity are now available for clinical use; the effects produced are similar to those of the naturally occurring steroids. These preparations have the advantage of being effective when administered orally and in low dosage. Figure 7 (*top*) illustrates some of the synthetic estrogens currently in use. Ethinyl estradiol differs from estradiol only in the addition of an ethinyl group at C-17. While estradiol is effective only by parenteral administration, ethinyl estradiol not only is effective when given orally but is equal in activity, milligram for milligram, to parenterally given estradiol. Other synthetic estrogens, such as diethylstilbesterol, chlorotrianisene (Tace), and methallenestril (Vallestril), differ markedly from the natural estrogens. These compounds are not steroids at all, since they do not have the cyclopentenophenanthrene configuration, yet they behave physiologically as estrogens and are active in relatively small oral dosage. Chlorotrianisene has the additional property of being stored in the body fat from which it is released slowly, thus probably permitting somewhat longer action in the body.

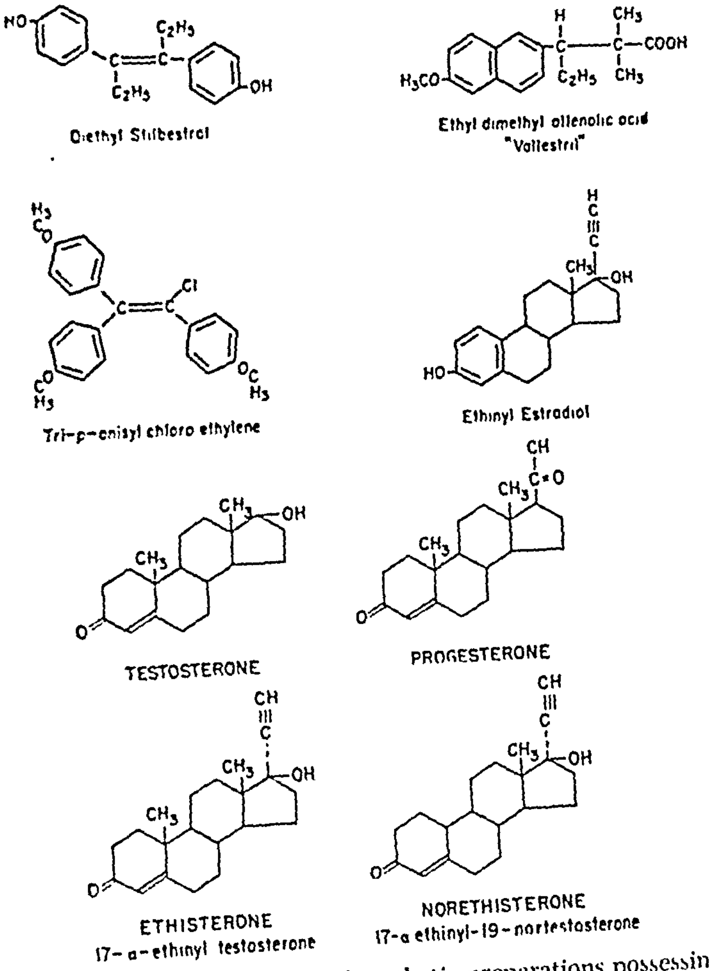
Diethyl Stilbestrol
Ethyl dimethyl allenolic acid "Vallestril"
Tri-p-anisyl chloro ethylene
Ethinyl Estradiol
TESTOSTERONE
PROGESTERONE
ETHISTERONE
17-a-ethinyl testosterone
NORETHISTERONE
17-a ethinyl-19-nortestosterone

Fig. 7.—*Top*, examples of synthetic preparations possessing estrogen effect. *Bottom*, structural configuration of testosterone and progesterone. Note chemical similarity between ethisterone and testosterone and marked increase in effectiveness of norethindrone (norethisterone).

Two interesting synthetic progestogens are ethisterone (Pranone) and norethindrone (Norlutin), which bear the disturbing chemical names of 17-α-ethinyl testosterone and 17-α-ethinyl-19-nortestosterone. Although these compounds are so closely related chemically to testosterone that they carry the androgenic nomenclature (fig. 7, *bottom*), their physiological activity is not androgenic but progestational in a manner entirely similar to progesterone. The incorporation of an ethinyl grouping apparently changes the physiological action from androgenic to progestational and at the same time changes the route of metabolism so that the hormones are effective when administered orally rather than parenterally. Although the primary action of these synthetic progestins is progestational, the possibility exists, especially in certain women, that the compounds may have some androgenic activity. Wilkins and associates recently reported the occurrence of nonadrenal masculinization of the external genitalia in 21 female infants, 15 of whose mothers had been treated for habitual or threatened abortion with ethisterone in large dosage early in pregnancy. Removal of the C-19 methyl group markedly increases the potency, so that norethindrone is effective in producing progestational changes in very low dosage. Recently another orally effective preparation has been synthesized which possesses pregestational activity as its principal effect but also possesses and exhibits minor estrogenic activity, e. g., norethynodrel (Enovid). This compound, unique in its chemical configuration, differs from norethindrone only in the position of the double bond in ring A, which is shifted from C-3 and 4 to C-5 and 10.

Modifications also may be made in the original steroid to enhance parenteral activity. For example, reaction of estradiol with benzoic or propionic acids to form estradoil benzoate and estradiol dipropionate decreases the rate of absorption so that the duration of hormone action is greatly prolonged. Likewise, progesterone recently has been modified to form hydroxyprogesterone caproate. Although 17-hydroxyprogesterone is a relatively weak progestogen, formation of the caproic acid ester makes it a highly effective and long-acting progestational preparation.

Antisteroids

Recently attempts have been made to directly counteract the effects of various hormones; the preparations possessing these properties have been termed antisteroids. The approaches have been directed toward inhibiting or removing the effect of estrogens or of aldosterone. It has been shown, at least in the experimental animal, that the effectiveness of these two hormones may be blocked, but the mechanism of action does not seem to demonstrate any direct effect on these specific ovarian or adrenal steroids themselves. The term "antialdosterone" has, in essence, been applied to the reversal of the electrolyte effects produced by the adrenal cortical hormones. Just as the 19-noranalogs of some of the newer progesterone preparations exhibit markedly increased activity, so too has it been shown that the 19-noranalog of antialdosterone seems to produce a more powerful blockade of the electrolyte effects than if the 19-R group were retained. The application of these hormones to clinical gynecologic practice, with a special reference to the pregnant patient and more particularly the patient with preeclampsia associated with increased sodium restriction, has been most discouraging. The same discouraging results have been also noted when attempts have been made to block estrogen effects in the gynecologic patient under estrogen therapy. Not only have the antiestrogens shown no reversal of electrolyte excretion, but no significant catabolic process occurs as measured by complete metabolic balance.

It is interesting to note that the structural formula for one of the so called antiestrogens is somewhat similar to the formula for chlorotrianisene. The basic carbon chain of the antiestrogen preparation is saturated when compared to the formula for diethylstilbestrol. Based on the similarity of the formula of chlorotrianisene and the antiestrogen preparation which inhibits estrogen activity, in the experimental animal, it would be interesting to speculate whether some of the so-called antiestrogen effects may be specific for a given type of estrogen preparation.

Conclusions

The approach to sensible hormone therapy in obstetric and gynecologic practice is to adhere to the physiological concepts currently acceptable. Since hormone therapy usually represents substitution for the gland producing that hormone, the indication for a given hormone should be a reduction in secretion brought about by anatomic or functional alteration of the gland. When a hormone preparation is administered, the target organ should be known. If the target organ is an endocrine gland, another hormone will be elaborated. It is generally accepted that, in human beings, a hormone does not act directly on the gland from which the hormone itself originated. In general, hormone therapy is valueless if the the target gland is absent, functionally or anatomically.

If the normal physiological effects of hormones are kept in mind, all hormonal therapy may be directed toward replacement of a specific hormone that is either missing entirely or inadequate in amount, and cosmos will replace the chaos which presently attends the problem of hormone therapy in gynecology.

URINARY CALCULI COMPOSED OF CYSTINE.—Cystinuria is an hereditary anomaly of renal function, with defective tubular reabsorption of cystine, lysine, arginine and ornithine. These amino acids, two of them essential to the body, are excreted in the urine in abnormal amounts throughout life. Only the excretion of the least soluble one, cystine, was recognized until recent times, and both the name and the clinical importance of the condition is entirely referable to this one amino acid. The only clinical consequence appears to be the frequent formation of urinary calculi composed of almost pure cystine. Most individuals homozygous for the cystinuria gene sooner or later form such stones, and the stones tend to recur. The sequelae may well lead to eventual renal insufficiency and death. Some of the individuals heterozygous for the cystinuria gene also excrete more than the normal amount of cystine, which can be detected by chemical tests such as the cyanide-nitroprusside reaction, but the amount here is not great and these individuals only very rarely form cystine stones. The incidence of chemical cystinuria is nevertheless much greater than the incidence of stone-forming cystinuria, since heterozygotes are vastly more common than homozygotes, and not all homozygotes have stones at a given time.—W. E. Knox, Sir Archibald Garrod's "Inborn Errors of Metabolism," *The American Journal of Human Genetics*, March, 1958.

PALPABLE CERVICAL LYMPH NODES

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Of the 40 to 100 lymph nodes demonstrable in the dissection of the normal human neck, a few are always palpable through the skin in normal living adults. Important decisions in medicine often depend on the results of such palpation. Careful techniques of examination here suggested increase the likelihood of detection and correct interpretation of cervical lymphadenopathy, but in many cases the diagnosis cannot be settled without aspiration biopsy or surgical exposure. When palpable nodes are found in the lymph drainage pathways from a known primary cancer site, thorough investigation may help in deciding between palliative and curative treatment.

One of the most accessible and informative areas for physical diagnosis is the lymph drainage system of the neck. Palpable nodes in this system are significant in varying degrees, from almost normal innocuous hyperplasia through chronic and acute inflammation to cancer. Physical examination is most rewarding when a careful technique of palpation is adapted to the anatomy and combined with a knowledge of clinical characteristics of lymph nodes and the pathways of lymph drainage. Arbitrary anatomic subdivisions of the neck (see figure) are here utilized for discussion of methods of examination, significance of palpable nodes, and physiological areas of lymph drainage.

Important decisions are made on the basis of data collected through physical examination of neck nodes, including the management of head and neck, thoracic, and abdominal cancers. Neck dissection may be based solely on the discovery of palpable nodes. Some reports[1] estimate that 20 to 50% of normal persons have palpable nodes in the neck. The present study indicates that all normal persons of college age or beyond have palpable nodes. A cleared specimen from a complete neck dissection will contain 40 to 100 lymph nodes. Although only a small number of these are palpable, proper examination will help to disclose them and define their nature.

Diagnosis

In many instances the pathological process producing palpable neck nodes is obvious from clinical characteristics alone. Acutely inflamed and suppurating nodes are red, painful, tender, and fluctuating. At the other end of the spectrum, neck nodes containing metastatic cancer are frequently nontender, stony hard, and fixed. In others, however, the cause of palpable lymph nodes may not be clear-cut. This is true in small obscure cancer-bearing lymph nodes and in obviously enlarged nodes. Chronic inflammation may result in hard, nonpainful, nontender nodes, and, conversely, cancer metastases may be at times soft, tender, and fluctuating because of superimposed infection. Operation for abscess should be avoided, since a later proper curative excision may be jeopardized.

Knowledge of the anatomic, physiological, and pathological pathways of lymph drainage is important. In cancers arising in the head and neck area, the lymphatic spread is generally from superficial to deep nodes and from above downward, with involvement of proximal nodes first. Certain conditions, however, may alter the pathways of drainage. If the usual anatomic channels are blocked, bilateral and retrograde channels may be invaded. The causes of node blockage include cancer invasion, inflammation, and surgical and radiation scars.[2] Under such conditions, distant, irregular, bizarre, and bilateral spread may occur. Because exceptions are notable, they must be considered in investigation and management of the individual cancer case. All palpable nodes in the path of drainage from a known primary cancer site must be investigated thoroughly. Aspiration biopsy, or frozen section microscopy at operation, may be necessary to reach the proper final decision of management.

Anatomy

Submaxillary Triangle.—In this study, lymph nodes are palpable in both submaxillary triangles in almost all normal individuals. They vary from 0.5 to 2 cm. in diameter and are usually flat, elliptical, or almond-shaped and firm but not stony hard. There may be several in front of, behind, or within the submaxillary gland. Different manipulations are used for their demonstration. When the neck muscles are relaxed and the mandible maneuvered downward, one or more nodes can be pulled up over the mandibular edge and held in position for further delineation. When released, the sensation of slipping down over the bony rim is felt. The most superficial nodes in the region of the facial vessels are best suited for this maneuver. Bimanual palpation is used for nodes within the submaxillary

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gland. One finger is placed in the floor of the mouth while the other hand palpates the submaxillary region from the exterior.

Submaxillary nodes are part of a superficial chain draining the lips and anterior part of the oral cavity. Cancers arising in this region, and from the tongue, may metastasize to these nodes early. Large, stony-hard nodes fixed to the mandible are a late manifestation of such spread. In early involvement, however, cancerous nodes may be indistinguishable from normal nodes; that is, such malignant nodes can be moved freely and elevated over the mandibular edge. Under these circumstances, decisions regarding neck dissection cannot be based on clinical examination alone unless the findings are obvious. Aspiration biopsy of palpable nodes and operation with frozen section microscopy are helpful in arriving at the correct decision in difficult cases.

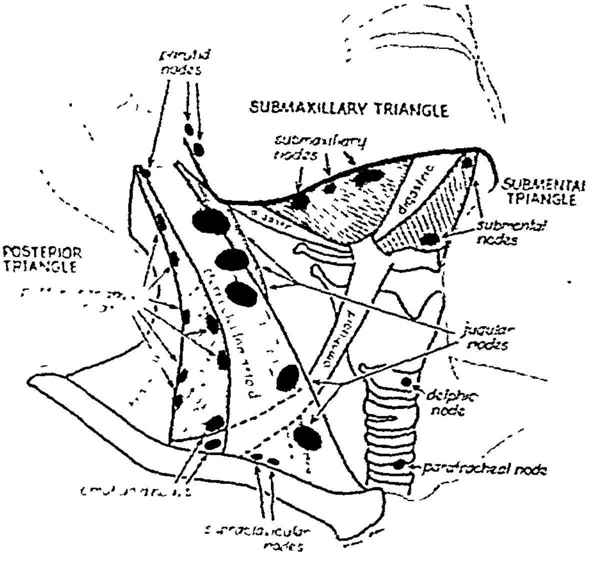
Submental Triangle.—Small, firm, submental nodes, usually less than 1 cm. in diameter, are palpable in about 25% of normal individuals. These may be due to previous or concomitant trauma or infection of the lips, gingiva, and oral cavity. As a rule, they remain palpable permanently. Submental nodes are palpated immediately adjacent to the mandible in the midline and in the interval between the heads of the digastric muscle just above the hyoid bone. They can be made to stand out if the digastric, mylohyoid, and geniohyoid muscles are tensed while the chin is held elevated. These nodes drain the anterior part of the oral cavity. As with submaxillary nodes, investigation and microscopic examination in cancer of this region is a requisite, even when the nodes are only a few millimeters in size.

Jugular Nodes.—Relatively soft, upper jugular nodes, as large as 2 cm. in diameter, have been found in over 50% of young normal individuals during seasons of upper respiratory infections. These frequently disappear after a few months. Jugular nodes are best palpated by grasping the sternomastoid muscle between the thumb medially and the fingers laterally. The muscle is relaxed by turning the chin to the side examined. This motion is repeated along the entire length of the muscle. Jugular nodes as high as the base of the skull may be palpated by rolling the thumb over the pulsating carotid area. They may also be defined from a standing position behind the patient.

The deep jugular nodes may be involved directly and initially from oral cancer or secondary to the more superficial submental and submaxillary nodes. Also, cancer of the larynx, pharynx, paranasal sinuses, salivary glands, and thyroid can spread directly to the jugular chain. Aspiration biopsy may be of aid in differential diagnosis, or exposure of the jugular chain may be included in a dissection for the primary cancer, particularly if in thyroid, larynx, or pharynx.

Posterior Triangle.—Posterior triangle nodes may be palpated in about 25% of normal persons. This examination is performed with flattened finger tips and often can be done best while standing behind the patient. Nodes immediately in front of the trapezius muscle are usually flat and small and result from previous infections of the skin, scalp, and retropharyngeal tissues. Occipital nodes may also drain these same areas. Posterior triangle node involvement occurs frequently and early in cancer of the nasopharynx. It is the first sign of such disease in 40% of cases. Cancer of the thyroid, extrinsic larynx, tonsil, and pharynx may also spread to this chain early. Oral cancer may spread to this chain after involvement of the jugular nodes.

Supraclavicular Region.—Palpable nodes around and below the omohyoid muscle, which are found in 25% of normal individuals, may be due to previous tuberculosis or other infection of the lungs. Palpation with flattened thumb or fingers is best. These nodes generally are not actively inflamed. Drainage from the upper lobe of the lung is to the homolateral side of the neck. In certain instances of left lower lobe disease, drainage is to the contralateral supraclavicular region. Supraclavicular nodes are frequently deep and medial to the sternomastoid muscle head as well as superficial and lateral.



Anatomic subdivisions of the neck.

Cancer of the lung and esophagus may spread upward to the paratracheal and supraclavicular nodes in the scalene muscle region. Cancer of the breast may spread to supraclavicular nodes after involvement of the axilla, or initially from a lesion in the upper quadrants. Hodgkin's disease and lymphosarcoma are often discernible in supraclavicular nodes as the earliest manifestation of the disease. Cancers arising in the abdomen, particularly stomach, pancreas, ovary, and testis, may spread through the thoracic duct to the lower cervical nodes, generally, but not always, on the left side. Supraclavicular node involvement is a late manifestation of spread from cancers arising in the head and neck area with the exception of thyroid and esophagus, which may spread to this area first. Because of the frequency of supraclavicular node metastasis from cancers of chest and abdomen, biopsy of any palpable nodes and removal of the scalene fat pad and paratracheal tissues containing nodes may help in diagnosis and decisions as to palliative versus curative treatment.

Summary

Cervical nodes are palpable in both submaxillary triangles, and frequently in other triangles of the neck, in all normal individuals. Detection of palpable cervical nodes in both normal and abnormal categories can be increased by careful techniques of examination. While in many instances the significance of palpable neck nodes is obvious from clinical examination, aspiration biopsy and/or exposure at operation may be necessary to make the diagnosis in certain cases. Palpable nodes in the lymph drainage pathways from a known primary cancer site should be investigated thoroughly.

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References

1. Ward, G. E., and Hendrick, J. W.: Tumors of the Head and Neck, Baltimore, Williams & Wilkins Company, 1950, p 716.

2. Sage, H. H., and Gozun, B. V.: Lymphatic Scintigrams: Method for Studying Functional Pattern of Lymphatics and Lymph Nodes, Cancer **11:**200-203 (Jan.-Feb.) 1958. Methods for Studying Lymphatic Function in Intact Man Utilizing Au^{198}, Proc. Soc. Exper. Biol. & Med. **97:**895-898 (April) 1958.

IMPOTENCE AND DIABETES MELLITUS

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and
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The frequency of difficulty in obtaining and maintaining satisfactory erections was studied in 198 diabetic men. The complaint of impotence was much more frequent in older patients; but by matching data on the various age-groups of diabetics against the data on the male population reported by Kinsey and his associates, the statistical significance of the twofold to fivefold increase in impotence in the diabetics was established. In the 30-34-year group, 25% of the diabetic men suffered from impotence. The incidence gradually increased with age to 53.6% for men 50 to 54 years of age. In some cases impotence was the symptom that led to discovery of an existing diabetes. The possibility of diabetes mellitus should be considered whenever a man complains of premature impotence.

In the course of interviewing gynecologic patients, we encountered a small number who reported that their husbands were impotent. Further inquiry revealed that several of these men suffered from diabetes mellitus. Although as early as 1906 Naunyn[1] wrote that impotence is one of the most common symptoms of diabetes, we were unable to find in the literature data bearing on this question. Hence, an investigation of the potency and fertility of diabetic men was undertaken.[2] This study revealed a surprisingly high incidence of impotence associated with diabetes. The data dealing with impotence in these diabetic men are presented here.

One hundred ninety-eight unselected men attending the outpatient diabetes clinics of the Hospital of the University of Pennsylvania and of the Philadelphia General Hospital served as subjects. They ranged in age from 16 to 92 years (average 56.9 years). Their ages at the onset of their diabetes ranged from 2.5 to 78 years (average 48.4 years).

The subjects' medical records were abstracted. Each man was questioned regarding his general health, diabetic status, and sex habits. Data were obtained concerning frequency of coitus, erectile and ejaculatory impotence, premature ejaculation, libido, morning erections, contraception, and venereal disease.

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For the purpose of this study, erectile impotence is defined either as constant difficulty in obtaining or maintaining an erection or as frequent difficulty in both obtaining and maintaining an erection.

Results

Incidence of Impotence.—Impotence occurred at an earlier age and more frequently among the 198 diabetic men than it did among the 4,108 men studied by Kinsey and associates.[3] As shown in table 1, from the age group 30-34 on, the cumulative incidence of impotence in the diabetic men is two to five times higher than in the population studied by Kinsey and associates.[3] This difference is statistically significant (by chi square analysis, P=<.01) from the 35-39 age group through the 65 to 69-year age group. The incidence of impotence by five-year age groups (table 2) gradually *increased from 25% in the 30-to-34-year age group* to almost 75% in patients 60 to 64.

Duration of Diabetes and Incidence of Impotence.—Seventy per cent of men with diabetes of less than one year's duration suffered from impotence. Among those who had had diabetes for one to five years, the incidence dropped to forty-three per cent. It was forty-five per cent among those who had had diabetes for more than five years. Thus, the incidence of impotence did not increase with a greater duration of the disease. The fact that seventy per cent of the men with a recent onset of diabetes (less than one year prior to the investigation) were impotent may have been due to the fact that many of them had just been found to be diabetic, and hence their disease often had not yet been well controlled. It was not uncommon for patients to report that until their diabetes had been stabilized they had been impotent and that their potency returned when their diabetic state was controlled. However, in those cases in which impotence developed while the diabetes was well controlled, it usually was more or less permanent. The generally high incidence of impotence is probably related to the fact that most of the men were in the older age groups. The average age at the onset of impotence for those with diabetes for less than one year was 50.7 years, for those with diabetes one to five years, 57.8, and for those with diabetes longer than five years, 52.1. Furthermore, in each group about half of the individuals were 60 years of age or older when they became impotent.

TABLE 1.—*Cumulative Incidence of Impotence in 198 Diabetic Men Compared with Its Frequency as Reported by Kinsey and Others*[3]

Age, Yr.	Population Studied		Impotent			
			No.		%	
	Diabetic	Kinsey	Diabetic	Kinsey	Diabetic	Kinsey
10-14	198	4,108	0	0	0.00	0.00
15-19	198	3,918	0	2	0.00	0.05
20-24	196	2,017	1	3	0.51	0.10
25-29	190	1,627	0	6	0.00	0.37
30-34	186	1,025	5	8	2.68	0.80
35-39	182	741	9	10	4.91*	1.35
40-44	174	513	13	10	7.46*	1.90
45-49	158	347	21	9	13.30*	2.60
50-54	145	236	34	16	23.20*	6.70
55-59	117	134	31	9	26.40*	6.70
60-64	87	87	35	16	40.20*	18.40
65-69	63	44	36	11	57.10*	25.00
70-74	36	26	21	7	58.40	27.00
75-79	15	11	11	5	73.40	45.00
80-84	5	4	4	3	80.00	75.00
85-89	1	...	0	...	0.00	...
90-94	1	...	0	...	0.00	...

* Statistically significantly higher than Kinsey's population (chi square analysis, P=<.01).

TABLE 2.—*Incidence of Impotence by Age Among 198 Diabetic Men*

Age, Yr.	Subjects, No.	Impotent, %
15-19	2	0.0
20-24	6	16.7
25-29	4	0.0
30-34	4	25.0
35-39	8	25.0
40-44	16	37.5
45-49	13	38.5
50-54	28	53.6
55-59	30	66.7
60-64	23	73.9
65-69	28	67.9
70-74	21	57.1
75-79	10	70.0
80-84	4	100.0
85-90	1	0.0

Thirty per cent of all those who became impotent did so within one year of the clinical recognition of their diabetes. Sixty per cent of the men who subsequently developed impotence did so within five years of the onset of their diabetes.

Severity and Complications of Diabetes and Impotence.—There was no apparent relationship between the severity of the diabetes and the incidence of impotence when severity of the disease was graded according to carbohydrate tolerance and insulin requirement as outlined by Wilder.[4] However, poor control of diabetes, with episodes of acidosis or hypoglycemia, often was associated with transient periods of impotence. Complications of diabetes, such as peripheral vascular disease, neuropathies, retinopathies, or renal or cardiovascular disease, were no more frequent among the impotent diabetics than among those who were potent.

Impotence and "Preclinical" Diabetes.—There was no higher incidence of impotence among the diabetic men prior to the clinical onset of their diabetes than was reported by Kinsey and associates[3] for their population.

Libido; Morning Erections.—Almost all subjects stated that libido persisted for some time after they had lost their coital abilities. Many of the younger men reported no decrease in libido, or only a slight decrease, in spite of inability to perform coitus. Despite the presence of libido, such individuals usually were unable to obtain or to maintain erections adequate even for masturbation. Among the older diabetic men (usually over 55 years of age) suffering from impotence, there was often a decrease in, or complete loss of, libido. According to Kinsey,[3] morning erections usually persist for several years after a man has become impotent. However, 53% of the diabetic men experienced no morning erections after they became impotent.

Comment

A strikingly high incidence of impotence was observed among the diabetic men in the present study. Furthermore, if impotence developed, it frequently did so early in the history of the diabetes. Indeed, in some instances, impotence was the symptom that first sent the patient to a physician and thus ultimately led to discovery of the diabetes.

The mechanism responsible for the impotence is not clear. Testicular atrophy[5] and calcification of the vas deferens[6] have been noted in diabetic men. However, their relationship to impotence is questionable. Furthermore, such findings are uncommon and hence cannot be associated with the high incidence of impotence found in the present study. Although a diminished 17-ketosteroid excretion has been reported as occurring frequently in diabetic males, it seems to have no correlation with impotence.[7] The impotence does not appear to be psychic in origin. Psychic impotence usually does not prevent morning erections or erections for masturbation, whereas many of the diabetic men were unable to experience erections under either of these two circumstances. Furthermore, in some instances the men became impotent before they knew that they had diabetes. Neurogenic changes in the erection mechanism may be responsible.

Summary

One hundred ninety-eight men attending outpatient clinics for the treatment of diabetes mellitus were studied in relation to frequency of coitus, erectile and ejaculatory impotence, premature ejaculation, libido, morning erections, contraception, and venereal disease. The incidence of erectile impotence at all ages was found to be two to fiv times higher than that reported by Kinsey an associates.[3] Twenty-five per cent of men betwee 30 and 34 years of age who had diabetes suffere from impotence. The incidence gradually increase with age to 53.6% for men 50 to 54 years of ag Thirty per cent of those who became impotent di so within one year after the clinical recognition o their diabetes. Sixty per cent became impoten within five years of the onset of their disease.

There was no apparent relationship between th age at onset of the diabetes, its duration or seve ity, or the presence of vascular, neurological, o other complications and the incidence of imp tence. Libido usually persisted for some time aft the appearance of impotence, even though all ere tions, including morning erections, often were al sent. Prior to the clinical onset of the diabetes the was no unusual incident of impotence. It is su gested that men complaining of premature in potence be investigated for diabetes mellitus.

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References

1. Naunyn, B.: Der Diabetes mellitus, ed. 2, Vienn Alfred Hölder, 1906.

2. Rubin, A.: Studies in Human Reproduction: II. Infl ence of Diabetes Mellitus in Men upon Reproduction, Am. Obst. & Gynec. **76:**25-29 (July) 1958. Babbott, D.; Rubi A.; and Ginsburg, S.: Reproductive Characteristics of Diabetic Men, Diabetes **7:**33-35 (Jan.-Feb.) 1958.

3. Kinsey, A. C.; Pomeroy, W. B.; and Martin, C. E.: Sexual Behavior in Human Male, Philadelphia, W. B. Saunders Company, 1948.

4. Wilder, R. M.: Clinical Diabetes Mellitus and Hyperinsulinism, Philadelphia, W. B. Saunders Company, 1940.

5. Warren, S., and LeCompte, P. M.: Pathology of Diabetes Mellitus, ed. 2, Philadelphia, Lea & Febiger, 1952.

6. Wilson, J. L., and Marks, J. H.: Calcification of Vas Deferens: Its Relation to Diabetes Mellitus and Arteriosclerosis, New England J. Med. **245:**321-325 (Aug. 30) 1951.

7. Miller, S., and Mason, H. L.: Excretion of 17-Ketosteroids by Diabetics, J. Clin. Endocrinol. **5:**220-225 (May-June) 1945.

CLINICAL RESEARCH.—In the past thirty years clinical research has become an important feature of the medical schools of this country and has been actively supported by the universities. However, there is danger that the universities may let this field slip from their hands now that clinical research is conducted on such an elaborate scale in institutes. With an eye on budgets, administrators of medical schools and hospitals connected with medical schools may be willing to let this essential function of the medical schools and these hospitals be done elsewhere. The clinical investigator may be regarded as an amphibian who is not well adapted to the environment of pure research or that of clinical medicine. It may be decided that the sole function of the hospital is the care of the patient and the sole function of the medical school is teaching the best of current medical practice. The lack of adaptation of the clinical investigator is only apparent for there is a large region that involves both the clinic and the laboratory where a rich life can be lived in a truly amphibian environment. Exploration of this area is essential to the development of real university clinical departments.—D. C. Darrow, M.D., The Role of the Patient in Clinical Research of a Physiological Problem, *The Yale Journal of Biology and Medicine,* September, 1957.

ACTIVATION OF THE PATIENT WITH SKELETAL METASTATIC NEOPLASIA

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The major problems in dealing with patients with skeletal metastatic disease are pain, fracture, neurological disability, and general inactivity. The broad aim in the management of the patient with bony metastatic carcinoma is the preservation of function, even in the face of imminent fracture. There must be a positive approach to the hopeless situation of widespread bony metastasis. Not only is the morale of the patient who is being treated raised but fellow patients with the same dread diagnosis of "cancer" see patients who get about and go home. It is the sole responsibility of the physician, once the decision is made to activate the patient, to follow this patient through the training program and not to relegate the supervision to a nurse or physical therapist.

In the aging population the incidence of degenerative and neoplastic disease must continue to rise. Due to continued progress in the techniques of surgery, radiology, and chemotherapy, the duration of life has also been extended in patients with neoplastic disease. This increased span of life is ineffectual if it is without function. It is therefore the duty of physicians to attempt to make these persons functional members of society, or continued progress in longevity is useless.

The major problems in dealing with patients with skeletal metastatic disease are pain, fracture, neurological disability, and general inactivity. In this latter category it is important to differentiate those patients who have truly terminal disease, and who should not be disturbed, and those patients who may improve with therapy.

Problems in Activation

Pain is the first and most important problem to be dealt with. It is the most common symptom of skeletal metastasis, often being the presenting complaint. Not uncommonly pain precedes any radiologic evidence of bone metastasis. Pain may be the controlling factor in the patient's ability to remain active. The production of this pain is usually due to periosteal stretching or invasion. Regardless of its cause, pain may start the familiar cycle of inactivity, debility, intercurrent infection, and premature death.

Fracture is the next problem, and it is a most dreaded complication of skeletal metastasis. It usually occurs in the weight-bearing bones, such as the vertebrae, pelvis, and femora. Other bones may be fractured, but they are less important as to function except in their production of pain. Fractures may be due to the normal weight-bearing stress or to minor trauma. Turning in bed can produce a fracture. The fear of fracture by the physician may well be the start of the inactivity cycle with its known consequences.

Fractures may occur in the course of activating the patient. We try to avoid this by supportive devices. It is necessary to weigh the many benefits obtained by mobilization against the calculated risk of the pain and greater immobility which a fracture may precipitate. In our experience, the patient gains more by remaining active with supporting devices, even in the face of imminent fracture, than by remaining immobile, which is rarely preventive in any case. We have actually seen, in some instances, that pain is decreased after activation. If a fracture occurs, the resulting additional disability is, as a rule, less destructive to the patient than prophylactic inactivation.

Neurological disability usually occurs as a result of vertebral fracture. The spinal cord can be compressed by vertebral collapse or damaged by interference with its vascular supply. The result is paraplegia or quadriplegia. Nerve roots may be similarly damaged. Peripheral nerves are occasionally injured by long-bone fractures.

Inactivity presents similar results whether it is due to a terminal state, pain, fracture, neurological disability, or iatrogenic factors, i. e., a physician's apprehension. Each of these causes can be dealt with properly, but a word is in order about the so-called terminal state. It is important to recognize the fact that certain of the neoplastic diseases respond temporarily to chemotherapeutic and radiotherapeutic techniques. Examples of such tumors are carcinoma of the prostate and breast, Hodgkin's disease, lymphoma, and multiple myeloma. In these instances the range of motion of joints must be maintained and muscle strength preserved. These simple measures are of obvious value should the disease process be temporarily suppressed. The avoidance of decubitus ulcers, urinary infection, and hopeless malnutrition are equally important at this time.

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Therapy for Activation

The broad aim in the management of the patient with bony metastatic carcinoma is the preservation of function. This can be accomplished by maintaining ambulation and independence in self-care activities. Mobilization, then, is the primary aim. Every procedure and every prescription must be a means toward that end. Even though pain is present, many patients, either in a hospital or at home, would prefer to endure pain and be able to maintain the dignity of self-care. They object to invalidism and being dependent on others. Physicians must recognize and encourage this attitude, while taking into consideration the general condition of the patient and the natural history of the disease. The physician must guard against the overprotection of a well-meaning family.

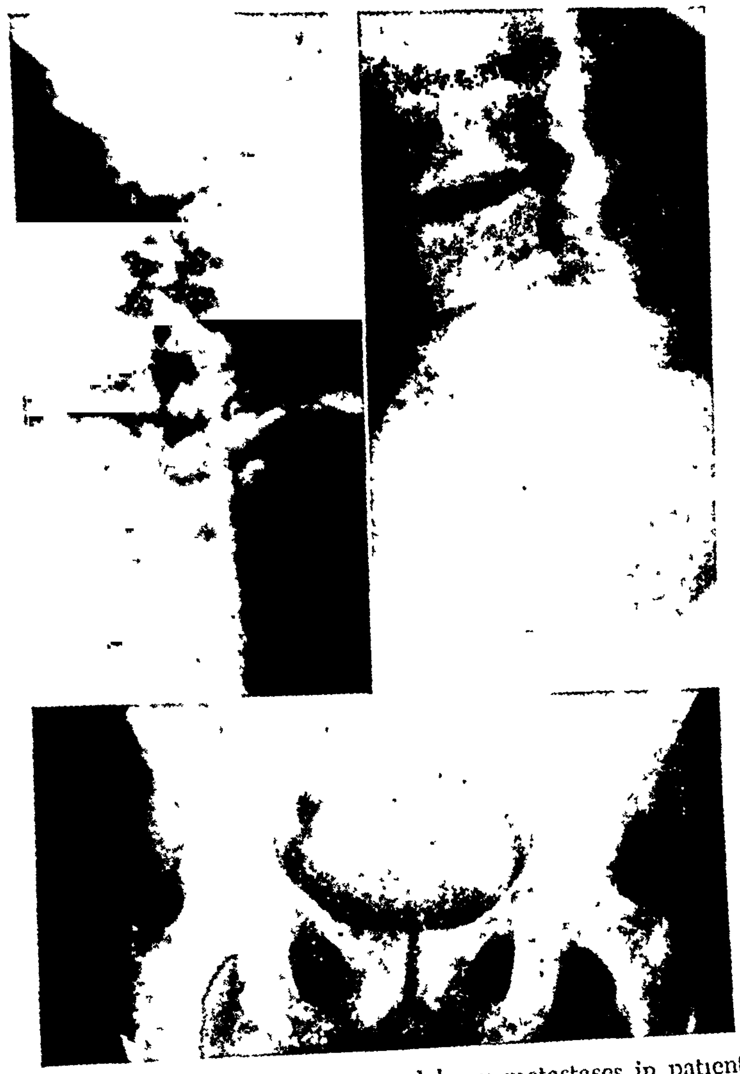

Fig. 1 (case 1).—Widespread bony metastases in patient with carcinoma of breast.

Complete bed rest is to be avoided. It is accompanied by negative nitrogen and calcium balance, muscle wasting, phlebothrombosis, and anemia. We assume that these do much to hasten death. Patients who are so severely ill that function and self-care are not feasible can still be gotten out of bed for standing with support. The use of a tilt table may be helpful in obtaining weight-bearing for short periods of time.

Specific measures must be individualized. To prevent pain and to minimize further damage where possible, every orthopedic device that would be indicated if neoplasm were not the cause of the disability must be used. Braces, molded jackets, plaster casts, and splints are supportive and may be needed. Surgery, even in hopeless cases, may be indicated to relieve pain or to increase function. Laminectomy after vertebral collapse associated with spinal block and the internal fixation of long bones and hip fractures are examples. Medication for analgesia should be kept to the minimum effective dosage to keep the patient's sensorium relatively clear and his food and fluid intake adequate. Following are summary reports of illustrative cases.

Report of Cases

Case 1.—A 42-year-old woman with carcinoma of the breast had a presenting sign of a fracture of the right humerus in December, 1956, at which time the breast lesion was noted. She had other bone pain at that time. After oophorectomy the bone pain cleared. Androgen therapy was started in October, 1957, because of the recurrence of bone pain. X-rays taken in February, 1958, revealed widespread bony metastases (fig. 1). She is now fully ambulatory, without support, with minimal pain.

Case 2.—In a 72-year-old woman the first manifestation of plasma cell (multiple) myeloma was a spontaneous fracture through the left acetabulum in 1953 (fig. 2). She became bedridden in November, 1956, because of pain in multiple bony sites. Treatment with urethan and radiatio was started in October, 1957, concomitant with reactivation. From being bed-bound, she mastered sitting, transfer to a chair, and sufficient walking with crutches to get around her home to a limited degree. This was with the aid of a Taylor-Knight brace.

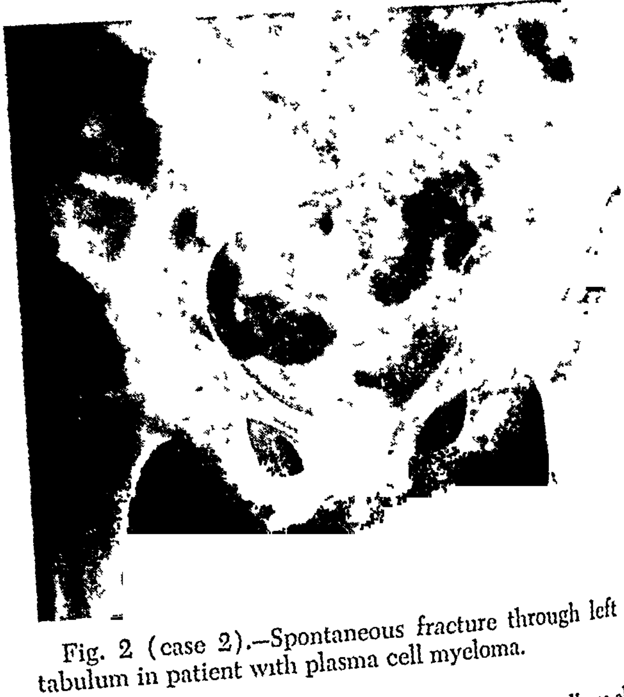

Fig. 2 (case 2).—Spontaneous fracture through left ac
tabulum in patient with plasma cell myeloma.

Case 3.—A 51-year-old woman with plasma cell myelo
had the onset of her disease in 1955. Six months prior
admission she noted slowly progressive hemiparesis of
right side. X-rays revealed cervical spine metastases
complete destruction of the second cervical vertebra
3A). There was also metastatic involvement of the
femur (fig. 3B). At the present time she is ambulating

but has a residual hemiparesis of the right side, she is independent in self-care activities, with the protection of a Thomas collar and a Taylor-Knight brace.

Case 4.—A 60-year-old woman with carcinoma of the rectum had surgery in March, 1956. In April, 1957, she had severe bilateral thigh pain that responded to radiotherapy with marked relief of pain. On admission in August, 1957, she ambulated with the use of a cane for support. X-rays revealed metastatic disease involving the right femur. While walking in the hospital, she experienced sudden pain and a feeling of "cracking" in the right thigh. X-ray revealed a pathological fracture (fig. 4*A*). Intramedullary nailing was performed on the right side (fig. 4*B*). A similar procedure was carried out on the left side because of metastases to the left femur, without fracture (fig. 4*C* and *D*). She became ambulatory for a very short time thereafter but soon died from widespread brain metastases.

Comment

Case 4 illustrates the problem, the decisions reached in attempting to solve the problem, and the result that, unfortunately, all too frequently occurs. Since we cannot predict when the inexorable result will occur, we continue to conform to our present approach.

This positive approach to the hopeless situation of widespread bony metastasis has one other very important effect. This is especially true in a hospital setting where patients with neoplastic disease may be housed together on one ward or one floor.

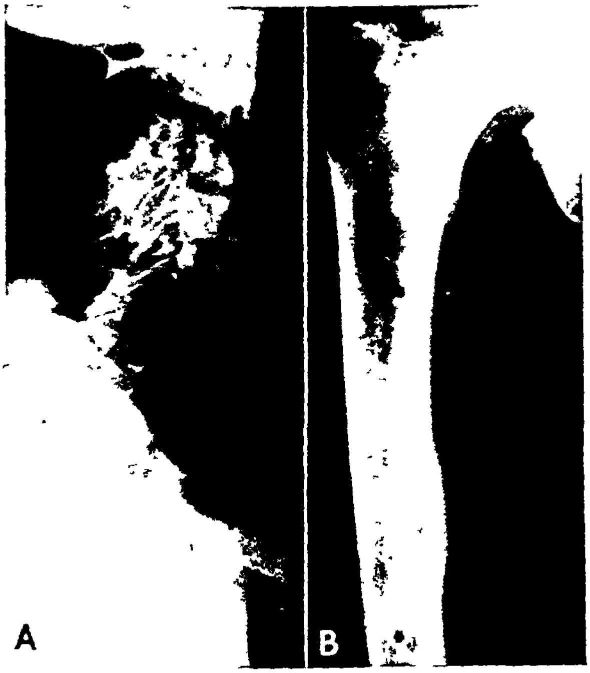

Fig. 3 (case 3).—Metastatic involvement of, *A*, cervical spine and, *B*, left femur in patient with plasma cell myeloma.

Not only is the morale of the patient who is being treated raised, but fellow patients with the same dread diagnosis of "cancer" see patients who get about and go home. An entire service can be transposed from the "waiting to die" attitude to a cooperative "perhaps something can be done" attitude. This attitude pervades not only the patients but the nursing and medical staffs as well.

Since paramedical personnel must be involved with the patient to be activated, it is of prime importance that those who work with these patients understand exactly what the basic problem is. It is the sole responsibility of the physician, once the decision is made to activate the patient, to follow this patient through the training program and not to relegate the supervision to a nurse or physical therapist.

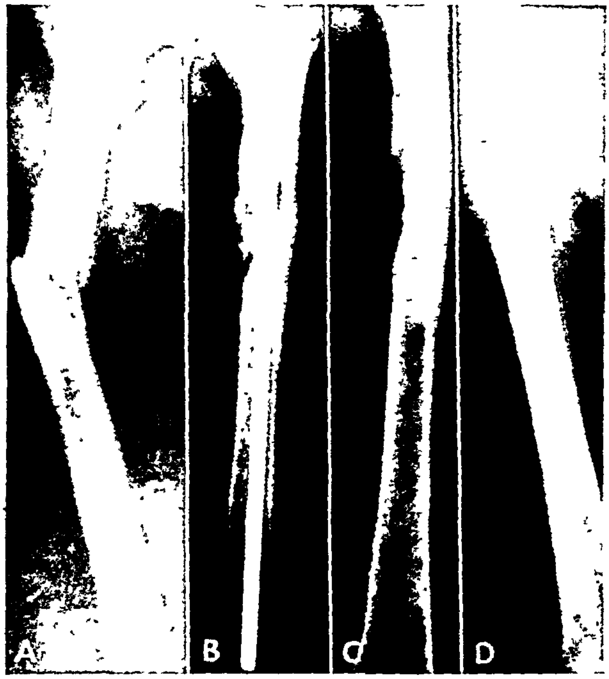

Fig. 4 (case 4).—Pathological fracture and treatment in patient with carcinoma of rectum: *A*, fracture of right femur; *B*, intramedullary nailing of right femur; *C*, metastasis to left femur (without fracture); *D*, intramedullary nailing of left femur.

Since certain legal aspects of activating a patient with bony metastasis and imminent fracture are apparent, it is necessary to keep well-documented, written records as to the physical and x-ray findings and to state the rationale of the decisions reached. It is also necessary to discuss these reasons with the family so that no misunderstandings can arise.

Conclusions

The pivot of this discussion is medical policy toward hopeless disease. This is rehabilitation, even if economic usefulness is excluded and the results are limited in duration. Each patient must be assessed with the very limited potential in mind and with a positive viewpoint toward the utilization of that potential within the natural history of the disease.

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USE OF SYMPATHETIC BLOCKS IN ORTHOPEDIC SURGERY

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Sympathetic blocks have been applied for disabilities of the shoulder, for edema or its residuals, for symptoms of reflex sympathetic dystrophy, and as an aid to physiotherapy or rehabilitation of joint motion. Most patients with reflex sympathetic dystrophy do not begin their illnesses as portrayed by typical textbook pictures. Many manifest no symptoms but pain. Others manifest only edema or pseudomotor or vasomotor disturbances. An additional observation is that these patients are slow to rehabilitate to normal joint function and/or to normal muscle strength. Of 100 patients analyzed as to the beneficial effects of sympathetic blocks, 45 showed marked and rapid improvement in progress in physiotherapy. It is a mistake to expect too much from a sympathetic nerve block.

During the past six years I have used sympathetic nerve blocks with increasing frequency on the orthopedic services of Army hospitals. This has resulted from a more liberal interpretation of the indications for their use in traumatized and surgical patients. As experience increased with the use of sympathetic blocks, I have used them earlier and more often in these cases. Also, the need for sympathetic blocks is recognized more often in patients with vague chronic disabilities, many of whom in reality suffer from reflex sympathetic dystrophy.

Review of Literature

Reflex sympathetic dystrophy is a disturbance of the sympathetic nervous system, characterized by pain and sympathetic phenomena which may follow major or minor trauma or surgical procedures. Causalgia was the term used by Mitchell, Morehouse, and Keen[1] at the time of the Civil War, when it was described so well by them. Reflex dystrophy was the term used by De Takats[2] to describe a wide range of related conditions from the relatively mild post-traumatic dystrophies, characterized by moderate pain, with sweating and changes in the color of the skin, to the agonizing torments of major causalgia. Other terms besides reflex sympathetic dystrophy used for these conditions have been minor causalgia,[3] post-traumatic painful osteoporosis, traumatic arthritis, post-traumatic spreading neuralgia, osteoporosis due to trauma (Sudeck's atrophy), post-traumatic vasomotor disorders, shoulder-hand syndrome, post-traumatic edema, traumatic angiospasm, or chronic traumatic edema. These variations are applied to the same basic disorders of neurophysiology but describe different manifestations or symptoms or combination of symptoms of reflex sympathetic dystrophy.[4]

Leriche[5] advocated infiltration of local anesthetic agents into the site of injury to produce analgesic block in minor sprains, strains, and fractures to prevent reflex dystrophy. He likewise suggested sympathetic block for this purpose. Faust[6] and Tyson and Gaynor[7] reported independently that they found the use of sympathetic blocks for this purpose of significant value. Bonica[8] reported the use of sympathetic blocks as a prophylactic measure in over 250 orthopedic patients. A significant decrease in postoperative pain, much earlier functional rehabilitation, and significant decrease in the incidence of reflex dystrophy were observed when results in these patients were compared to those in a like number of patients not receiving blocks. Betcher, Bean, and Casten[9] reported similar observations in 49 patients in whom continuous paravertebral blocks were used. However, no correlation has been established between the type and severity of injury and the incidence or cause of reflex sympathetic dystrophy.[8] This does not help in the selection of patients who are to receive prophylactic sympathetic block.

The symptoms of reflex sympathetic dystrophy in order of their frequency are (1) pain, burning or aching in type, and relieved by sympathetic block; (2) hyperesthesia, which is common and of constant annoyance and discomfort to the patient; (3) vasomotor dysfunction, a common manifestation of the various types of the disease, such as cyanosis and coldness or redness and increased heat (signs of both vasoconstriction and vasodilatation have been reported as predominant manifestation in different series); (4) edema in most cases; (5) pseudomotor disturbances, not constant in incidence in individual cases or in case reviews; and (6) trophic changes, considered to be a late stage of reflex sympathetic dystrophy or one that has progressed quite rapidly, including thin glossy skin, atrophy of muscles, decalcification of bone, and changes in the ap-

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pearance of the nails and hair. (Trophic changes develop insidiously, and marked weakness has been recorded as occurring in almost all cases.)

Selection of Patients for Sympathetic Blocks

In my experience most patients with reflex sympathetic dystrophy do not begin their illnesses as portrayed by typical textbook pictures. Many manifest no symptoms but pain. Others manifest only edema or pseudomotor or vasomotor disturbances. Such patients with early reflex sympathetic dystrophy with single symptoms or no objective signs are difficult to recognize. If prophylactic sympathetic blocks are to be used early to successfully prevent or treat reflex sympathetic dystrophy and to thus shorten the rehabilitation of such patients, much time is lost awaiting combination of symptoms or severity of a symptom to warrant the diagnosis of reflex sympathetic dystrophy. For this reason, the blocks have been used prophylactically to treat the patients with any of the symptoms described as manifestations of reflex sympathetic dystrophy—namely, pain, swelling, cyanosis, coldness, or redness and increased heat of extremities or increased sweating of the injured part.

An additional observation in my experience is that, though the incidence of symptoms does vary, one factor is common to all patients. These patients are slow to rehabilitate to normal joint function and/or to normal muscle strength. A failure to progress at a normal rate in rehabilitation of joint[10] and limb function seems to be quite characteristic of the orthopedic patients treated for this condition in Army hospitals.

Since this observation has been made, all patients showing poor or slow progress in physiotherapy are reevaluated. If any single symptom is discovered that would warrant suspicion of reflex sympathetic dystrophy, sympathetic blocks are used. In most cases the blocks are timed to allow the physiotherapist to work with the patient while the objective effects of the block are still present. This seems to give more rapid response to the use of sympathetic blocks as an aid to physiotherapy. The results have been gratifying and in some cases startling. In some cases the blocks have been used empirically as an aid to physiotherapy. Though the results are not uniformly successful, the orthopedist and physiotherapist have been surprised at times with the sudden onset of rapid improvement in these patients.

The enthusiasm for the method of selection of cases and prophylactic early use of sympathetic blocks seem justified from the results seen clinically. This prompted an analysis of 101 consecutive patients treated over a two-year period. This study was further felt to justify our enthusiasm and to clarify the indications used in selecting patients for the use of sympathetic blocks.

Review of One Hundred Cases

Of the cases reviewed, no case was dropped for incompleteness of record. One case was considered unsuitable for study in that the patient was treated unsuccessfully with continuous epidural anesthesia, rather than intermittent blocks, for post-traumatic vascular insufficiency and gangrene of the lower extremity. This left 100 cases available for study. A rough division of the 100 patients as to primary diagnosis were those with bursitis, acute or chronic, or the residuals thereof, 10 cases; reflex aching of the extremity, 6 cases; trauma of the joint with limitation of motion, 9 cases; postfracture limitation of joint motion, 20 cases; postsurgical limitation of joint motion, 13 cases; reflex sympathetic dystrophy, 29 cases; swelling, post-traumatic and surgical, 11 cases; and swelling as a residual of vascular complications, 2 cases.

Stellate blocks were used 158 times in 77 patients. Of the patients receiving multiple stellate blocks, 16 received 2; 12 received 3; 8 received 4; 1 received 5; and 1 received 20 blocks. Twenty epidural blocks were used in 12 patients. Two patients received both epidural and lumbar sympathetic blocks. The immediate success and the effect of the blocks were observed and recorded in almost all cases in this study.

The sex of the patients treated was predominantly male (90 males and 11 females). There were 85 patients treated as inpatients and 16 as outpatients. Age of the patients studied varied, as might be expected. The youngest patient receiving sympathetic blocks was 14 years of age, and the oldest was 60 years of age. The average age of the patients treated was 30.3 years.

The analysis of etiology by exact diagnosis was very complicated due to the multiplicity of diagnosis in the many traumatic cases as well as a great variation in the parts of the body involved. It added nothing to the analysis other than to confirm the works of previous investigators which showed no correlation between the type and severity of injury and the cause of reflex dystrophy. The shoulder, forearm, wrist, and hand predominated in location of inflammation of soft tissue, fracture, and dislocations that required sympathetic blocks for their residuals.

An analysis of time of application of the blocks was not revealing. In most traumatic cases, they were used very early, especially to relieve swelling. In some cases, they were used for long-standing complaints or residuals of months or years duration. In this series the patient with the longest duration of residuals successfully treated with sympathetic blocks had been symptomatic 10 years.

There were 16 patients with recent inflammatory lesions and 19 with lesions that had occurred at a more remote time, 40 with recent fractures and dislocations and 20 remote, and 4 with recent tendon injuries and 1 remote. A further analysis showed 31 patients with residuals or complications of operation. In 21 of these patients the operation had been recently done; in 10 the time of operation was remote. There were 15 patients with fractures and dislocations recently treated surgically and 8 in whom the time of operation was remote.

The 100 patients were analyzed as to the beneficial effects observed and recorded. Seventeen patients showed benefit in progress in physiotherapy. These patients manifested no symptom or combination of symptoms to warrant the diagnosis of reflex dystrophy. Ten patients with swelling as the only manifestation were aided greatly in physiotherapy. Seven patients who had a diagnosis of reflex sympathetic dystrophy with swelling were aided in physiotherapy. Eleven patients with reflex dystrophy without swelling made much more rapid progress in physiotherapy when blocks were used. Six patients with reflex dystrophy and swelling were cured, and all swelling rapidly disappeared, though improvement of joint motion and muscle strength could not be credited to the treatment in that joint limitation and lack of muscle strength were not present. Sixteen patients were successfully treated for swelling only. Seventeen patients with the primary diagnosis of reflex dystrophy without swelling were treated successfully with blocks. These patients manifested vasomotor changes without edema and were not actively treated in physiotherapy because of plaster of paris immobilization in use, or they were patients not actively treated in physiotherapy at the time sympathetic blocks were used. Some of these patients subsequently received physiotherapy, but valid conclusions could not be obtained. The exclusion of 10 patients with bursitis of the shoulder and 6 treated only for reflex aching pain without joint limitation left 84 patients. Our review showed that 45, or 53%, of the patients in this series had proved marked and rapid improvement in progress in physiotherapy with the use of the sympathetic blocks. It was felt that this percentage would be higher if the blocks had been timed properly in all cases.

The difficulty in selection of patients in early stages of illness to receive sympathetic blocks by other means was shown statistically. Of the 100 patients only 29 showed symptoms or combination of symptoms to warrant the diagnosis of reflex sympathetic dystrophy prior to treatment. After treatment, the detailed analysis of cases showed 41 to be unquestionably of the type to justify the diagnosis of reflex sympathetic dystrophy.

The analysis of results showed that 100 patients received sympathetic nerve blocks. Of these, no patient failed to receive effective blocking of the sympathetic nerve. Some blocks were ineffective or the effect was not maximal, and these were repeated with good results. Some patients, for full results, required repeated blocks when original results were found to be temporary. In some patients lumbar sympathetic blocks produced temporary improvement, but epidural blocks produced the cure.

Ten patients failed to receive significant benefit from the sympathetic blocks as expected. An analysis of these failures showed that five received single blocks. Two of the 10 received epidural, 5 lumbar sympathetic, and 3 stellate blocks. In some of these patients blocks were used empirically, as mentioned previously. One patient with septic arthritis of the ankle developed typical signs of reflex sympathetic dystrophy. Lumbar sympathetic blocks failed to result in improvement. Improvement resulted only after arthrodesis of the ankle. The sympathetic blocks were not successful because the cause of the reflex sympathetic dystrophy was still active. Only by relief of the original active cause was the sympathetic dystrophy cured and the patient rehabilitated. It is a mistake to expect too much from a sympathetic nerve block.

Report of Cases

A few brief case reports are presented to show the difficulty in diagnosis and the need for early prophylactic sympathetic blocks. Eight patients showed no manifestation of reflex sympathetic dystrophy but aching pain.

Case 1.—This 24-year-old man had osteotomy of the right femur performed for shortening with intramedullary nail fixation in January, 1954. This healed well. When the patient was seen by me one and one-half years later he showed marked disuse atrophy of the right lower extremity. He could complete a full range of motion with the right knee, but the strength was very poor. He complained of aching pain in the right lower extremity. Intensive physiotherapy was utilized in an effort to build up the musculature of this lower extremity, but the patient failed to improve.

On reevaluation, it was noted that some of the aching that the patient complained of even included aching in the foot. There were no other signs of reflex sympathetic dystrophy. An epidural anesthetic was given on March 22, 1955, and repeated two days later. The patient obtained complete relief of the subjective signs of aching and pain in the lower extremity. Physiotherapy then progressed rapidly, and the musculature of the hip, thigh, and leg built up as ordinarily expected, without the presence of reflex sympathetic dystrophy. He returned to duty in three and one-half weeks. If blocks had been used earlier in his rehabilitation, he would have been saved one and one-half years' disability.

The series reviewed showed that many patients, with histories much like that of this patient, would have been benefited had they been treated earlier with sympathetic blocks. In 16 patients there was control of edema. Some of these had edema only.

Case 2.—This 22-year-old man was admitted on May 3, 1953, with a fracture of the tibia. This was treated by open reduction on May 7, 1953, with screw fixation. The patient was immobilized in a long leg cast. Upon removal of the cast to start physiotherapy, edema developed. His convalescence and progress were blocked by this continued edema. Pain and other signs of reflex dystrophy were not apparent. The patient was given an epidural block on Aug. 18, 1953, with immediate dramatic improvement in the swelling. With further use of this extremity, the edema disappeared completely, and no further blocks were necessary. The patient returned to duty on Sept. 3, 1953, 15 days after receiving the block.

Case 3.—This 22-year-old man was seen on April 21, 1954. He manifested severe pain and marked swelling of the right forearm. X-rays of the right forearm and arm were negative for fracture but showed extreme swelling. An airplane door had been closed forcibly, crushing the patient's forearm in the doorway. A diagnosis of traumatic myositis and possible early contracture due to ischemia (Volkmann's contracture) was made. The patient was scheduled for surgical incision to relieve the tension in the forearm fascial compartments. A stellate ganglion block was given shortly after his admission. He had dramatic relief of the pain, formerly not relieved by opiates. Pain decreased with each subsequent block, the swelling decreased, and excessive tension was no longer palpable. The sympathetic blocks were then repeated, and an operation was not done. The patient received 2 to 4 blocks daily; a total of 20 blocks were used. This controlled the pain and swelling. The patient eventually recovered full function of hand, wrist, and forearm. It was felt that this represented a case where stellate ganglion blocks in controlling the pain and swelling had prevented a possible contracture due to ischemia.

The patient in case 4 developed typical early findings of reflex sympathetic dystrophy.

Case 4.—This 33-year-old man suffered an original acute dislocation of the right shoulder which was reduced on April 23, 1954. On removal of his immobilization he developed severe pain and limitation of motion with signs of reflex sympathetic dystrophy of the hand. Swelling, redness, and increased sweating with stiffness on motion of the hand and wrist were marked. X-rays were negative for fracture. On June 5, 1954, a stellate ganglion block was given. This was repeated daily until four blocks had been utilized. The swelling, sweating, and redness disappeared rapidly. Physiotherapy was able to progress normally after use of the first stellate ganglion block, as though the patient did not have reflex sympathetic dystrophy. The patient was discharged in three weeks. Follow-up has never shown any recurrence of the symptoms or reflex dystrophy. This represents a successful case of early treatment of the reflex sympathetic dystrophy.

Case 5.—This 34-year-old woman was treated Jan. 12, 1954, for a dislocation of the hip and an undisplaced fracture of the second and third metatarsal bone of the left foot. Her convalescence was completely uneventful with the exception of some complaints of aching pain in the left foot. This was mild in intensity and was thought to be a normal residual of the postimmobilization period.

Fourteen months after the injury the patient returned. At that time she complained of pain in the foot which had become much worse. She had increasing pain without having suffered any additional injury. At that time pseudomotor signs of vasodilatation were present in the foot that had not been present before. A diagnosis of reflex sympathetic dystrophy was made, and the patient received an epidural anesthetic. The reflex dystrophy improved dramatically with marked relief to the patient. The epidural block was repeated when slight aching recurred. She has been without pain to date. If her original mild aching pain had been treated with sympathetic blocks the later admission for reflex sympathetic dystrophy could have been avoided.

Case 6.—This 39-year-old man was seen on Oct. 14, 1954. The ulnar side of his right hand manifested aching pain, color changes, and increase in sweating. There was some stiffness in the finger joints, and the patient was unable to form a full fist. He had suffered a small stab wound of the right hand two months previously and had injured an old fracture site of the fifth metacarpal a month previously. He received one stellate ganglion block shortly after admission. This produced excellent results. All signs of reflex dystrophy disappeared. He was placed in physiotherapy and returned to duty in 11 days with a normal functioning hand.

The following case is an example of pseudomotor manifestations only.

Case 7.—This 25-year-old male had been wounded in action in Korea and suffered a compound fracture of the femur, tibia, and patella of the right lower extremity. He also had osteomyelitis requiring prolonged immobilization. He developed a spontaneous fusion of the knee with 10-degree flexion and healing of the bone infection. When physiotherapy was started in an effort to ambulate the patient, sweating was first noted in the lower extremity. The patient did not complain of pain but made no progress in physiotherapy. He was given a lumbar sympathetic block. Immediately his progress improved. The sweating of the whole left lower extremity decreased. The patient's musculature improved with further physiotherapy, and he was discharged as asymptomatic one month after the block.

Case 8.—This 25-year-old male was admitted Sept. 15, 1954. He had suffered a fracture of the third metacarpal bone one year previously, which had healed with malunion with prominence of the metacarpal head into the palm of the hand. It was felt that an operation would be required to correct the malalignment. Further close examination showed that the patient had some increased sweating of the hand. There was no swelling, color change, or other sign of reflex dystrophy. However, the pain that the patient complained of was out of proportion to the physical findings, and he failed to show either cooperation or progress in physiotherapy. For this reason stellate blocks were used. This resulted in cooperation of the patient with physiotherapy, and pain did not recur in the patient's hand. The patient's hand became asymptomatic in spite of the mechanical difficulties from the malunion, operation was not necessary, and the patient was discharged to duty.

The following few cases show dramatic aid to physiotherapy by sympathetic blocks.

Case 9.—This 28-year-old male was treated for a dislocation to the right patella on May 7, 1954, by a walking cylinder cast and crutches. His course had been uneventful until his cast was removed and physiotherapy started. Muscle strength and motion were not regained, and the patient seemed to be losing strength of the quadriceps musculature. Pain on use of the knee was mild, and swelling was not present. No other signs of reflex sympathetic dystrophy were noted. An epidural block was used July 13, 1954. Immediately thereafter the pain diminished and disappeared, motion was regained, and the strength of the musculature immediately improved. It improved sufficiently for the patient to return to full duty, with no recurrence of symptoms of reflex sympathetic dystrophy, in three weeks.

Case 10.—This 33-year-old man suffered a fracture of the inferior pole of the right patella. On Sept. 14, 1954, an arthrotomy was performed with excision of the inferior pole of the patella. The patient was immobilized in a long leg cylinder cast for six weeks. When the cast was removed very slow progress was made in physiotherapy. Signs of reflex sympathetic dystrophy and swelling and induration were not present. Because of lack of progress in physiotherapy an epidural block was performed. The patient immediately began to obtain increased range of motion in the knee and increased strength of the musculature of the lower extremity. He obtained a full range of extension, and flexion progressed to 90 degrees in one week. The patient was discharged from the hospital seven days after the block and progressed quite satisfactorily in physiotherapy.

Case 11.—This 14-year-old boy was treated on Dec. 4, 1954, for a slipped femoral epiphysis of the distal end of the femur. A closed reduction and immobilization in a hip spica was used. When the cast was removed the patient had aching pain in the knee, but this information was elicited only on questioning. Physiotherapy did not progress satisfactorily. The patient had limitation of motion from full extension to 15 degrees of flexion. It did not improve. Because of lack of progress in increasing range of motion an epidural anesthetic was given on March 13, 1955. Progress in physiotherapy with improvement of motion of the knee started immediately after use of the first epidural block. The patient progressed to 90 degrees of pain-free motion of the knee and was discharged to outpatient status. Subsequently he regained further motion of the knee and remains free of pain.

Case 12.—This 21-year-old man suffered a traumatic dislocation of the second metacarpophalangeal joint and a chip fracture of the head of the third metacarpal bone of the left hand. Open reduction was required to reduce the dislocated second metacarpophalangeal joint. The involved joints healed well, and physiotherapy was started early. Progress in physiotherapy for the first few days was slow. Examination of the patient's hand showed very slight residual edema of the involved fingers and the dorsum of the hand. The joints were not unusually painful, and the patient did not complain of other symptoms of reflex dystrophy. He was given three stellate sympathetic blocks followed by physiotherapy at three-day intervals. Immediately after the first stellate block had been given, there was rapid progress in physiotherapy. The patient was discharged from the hospital 10 days after the first block had been given, at which time he lacked only 5 degrees of extension and had normal flexion of the involved joints.

Comment

Analysis of these 100 cases showed that sympathetic blocks had been applied for disabilities of the shoulder, for edema or its residuals, for symptoms of reflex sympathetic dystrophy, and as an aid to physiotherapy or rehabilitation of joint motion. An analysis of case results was attempted. Some patients manifested only one of the symptoms of reflex sympathetic dystrophy, while all possible combinations of symptoms were present in other cases.

Motion of joints was increased noticeably by the use of sympathetic blocks in 46 patients, swelling subsided or decreased markedly in 39, and reflex sympathetic dystrophy responded satisfactorily in 41. Sympathetic block, like any other surgical procedure, is capable of producing complications. Two cases in this series were complicated by transient aseptic meningitis. One patient receiving a lumbar sympathetic block also developed a pneumothorax. Sympathetic blocks should be performed by personnel trained in their use and under hospital conditions.

Summary and Conclusions

A review of 100 orthopedic cases has been made, in which sympathetic blocks were used prophylactically. Patients who showed any single symptom that could be a part of the symptom complex of reflex sympathetic dystrophy were selected for the early use of sympathetic blocks. This method has proved practical in my experience over a four-year period. Valuable time in patient rehabilitation has been saved by its use.

Sympathetic blocks are a definite aid to physiotherapy. All traumatized patients should be watched closely in physiotherapy during the recovery period. Any patient who fails to progress satisfactorily should be reevaluated early. Any manifestation such as aching pain, swelling, cyanosis, redness, or increased sweating of the part may indicate the need for sympathetic blocks. This simplified method of selection of patients for early prophylactic sympathetic nerve blocks makes the benefits available to many more patients. If the diagnosis of reflex sympathetic dystrophy is made before sympathetic nerve blocks are used, fewer patients will be treated early and prophylactically. The use of sympathetic blocks for these effects of pain should not delay the surgeon in the use of the proper surgical procedures to eliminate the source of pain.

References

1. Mitchell, S. W.; Morehouse, G. R.; and Keen, W. W.: Gunshot Wounds and Other Injuries of Nerves, Philadelphia, J. B. Lippincott Company, 1878.

2. De Takats, G.: Nature of Painful Vasodilatation in Causalgic States, Arch. Neurol. & Psychiat. **50:**318-326 (Sept.) 1943.

3. Homans, J.: Minor Causalgia Following Injuries and Wounds, Ann. Surg. **113:**932-941 (June) 1941.

4. Fenton, R. L.; Wetchler, B. V.; and Weygandt, G. R.: Observations on Use of Sympathetic Nerve Blocks in Orthopedic and Traumatic Surgery, Surgery **41:**478-487 (March) 1957.

5. Leriche, R.: La chirurgie de la douleur, ed. 3, Paris, Masson & Cie, 1949.

6. Faust, F. L.: Repeated Sympathetic Blocks: Their Limitation and Value, Anesthesiology **7:**161-175 (March) 1946.

7. Tyson, M. D., and Gaynor, J. S.: Interruption of Sympathetic Nervous System in Relation to Trauma, Surgery **19:**167-176 (Feb.) 1946.

8. Bonica, J. J.: Management of Pain, Philadelphia, Lea & Febiger, 1953.

9. Betcher, A. M.; Bean, G.; and Casten, D. F.: Continuous Procaine Block of Paravertebral Sympathetic Ganglions: Observations on 100 Patients, J. A. M. A. **151:**288-292 (Jan. 24) 1953.

10. Moore, D. C.: Regional Block: Handbook for Use in Clinical Practice of Medicine and Surgery, Springfield, Ill., Charles C Thomas, Publisher, 1953, p. 93.

ROENTGENOGRAPHIC DIAGNOSIS AND SURGICAL TREATMENT OF BASILAR ARTERY INSUFFICIENCY

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Atheromatous obstructions impairing the cerebral circulation may involve the vertebral as well as the carotid arteries. Vertebral artery blood flow has been restored in a series of eight patients who had occlusive lesions in the subclavian artery proximal to the origin of the vertebral artery. In these patients the vertebral arteries themselves were not involved in the occlusive process, and it was found possible to restore normal flow through them by using bypass grafts. Localized vertebral artery obstruction may also occur in patients with basilar artery insufficiency, and this article is concerned with the technique and results of operation in a 55-year-old man whose illness began with a sudden attack of extensive paralysis and total blindness. The occlusion was complete on the right and incomplete on the left, being localized to a discrete atheroma near the origin of the vertebral artery. The partially occluding lesion was removed, and normal blood flow was restored through the vertebral artery and hence through the basilar artery. Cerebral arterial insufficiency is due to discrete extracranial occlusion in many instances, and the significance of this case lies in the fact that basilar artery circulation may be restored by surgical means as has been previously demonstrated in the treatment of occlusions of the cartoid arteries.

Atheromatous occlusions of the internal carotid artery in the neck and great vessels at their origin from the aortic arch have emerged as clinical entities.[1] These lesions are manifested clinically by symptoms of cerebral arterial insufficiency in the distribution of the anterior and middle cerebral arteries. Precise diagnosis and localization of the lesion is obtained by carotid arteriography, as introduced by Egas Moniz,[2] and by angioaortography, as described by Robb and Steinberg.[3] The frequent discrete nature of the occlusive process in the neck or thorax with the artery being relatively normal both proximal and distal to the lesion, particularly during the early phases of the disease, has led to the application of certain operative procedures designed to restore normal circulation.[1] The well-localized lesion may be removed by endarterectomy. In other instances, particularly in the great vessels in which the lesion is more extensive, the occlusion may be bypassed by use of a graft, one end of which is sutured to the artery proximal to the lesion and the other to the patent segment of artery distal to the obstruction.[1a]

After the successful application of this approach in a patient with occlusion of the left carotid artery on Aug. 7, 1953, we have applied these techniques in the treatment of 43 lesions occurring in the internal carotid, innominate, subclavian, and left common carotid arteries. Circulation has been restored in all patients with the more proximal lesions occurring near the aortic arch and in all but one in whom the lesion obstructed the origin of the internal carotid artery. Persistent neurological deficits, including weakness, aphasia, visual disturbances, and mental obtundity, which occurred before operation have been relieved, and episodic recurrent strokes which occurred repeatedly in 14 patients before operation have not recurred in any patient after operation.

Atherosclerotic lesions may also occur in the basilar arterial system which supplies blood to such vital centers as the brain stem, cerebellum, and posterior part of the cerebral hemispheres and may produce manifestations of cerebral arterial insufficiency, recognized clinically as "basilar artery thrombosis." Recent anatomic studies by Hutchinson and Yates[4] in patients dying of cerebrovascular accidents indicate that 39% of these patients have basilar artery insufficiency resulting from obstructive lesions frequently located in the cervical segments of the vertebral arteries. Simultaneous occlusions of the internal carotid and vertebral arteries were found in 30% of the cases. This finding assumes great significance in light of the fact that the basilar artery through the circle of Willis constitutes an important source of collateral blood flow in patients with carotid occlusion (fig. 1). The frequency with which the two main routes of cerebral circulation are simultaneously involved indicates the potential limits of natural collateral blood flow after cerebral arterial occlusion and emphasizes the desirability of a therapeutic attack designed to restore blood flow in the posterior cerebral circulation.

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Vertebral artery blood flow has been restored in eight patients in our series with occlusive lesions occurring in the subclavian artery proximal to the origin of the vertebral artery by the use of bypass grafts extending from the aorta to the subclavian artery distal to the occlusion, as previously described.[1a] The vertebral arteries in these cases were uninvolved by the occlusive process, and normal circulation was restored in these vessels by the establishment of normal blood flow in the distal patent subclavian segment from which the vertebral arteries originated. The importance of normal circulation in the vertebral arteries of these patients was evidenced by simultaneous carotid artery obstruction in six patients, three of whom had bilateral carotid artery occlusions. The purpose of this report is to indicate the feasibility of accurate diagnosis and successful surgical treatment of lesions located primarily in the vertebral artery which produced basilar artery insufficiency, as demonstrated in the following case report.

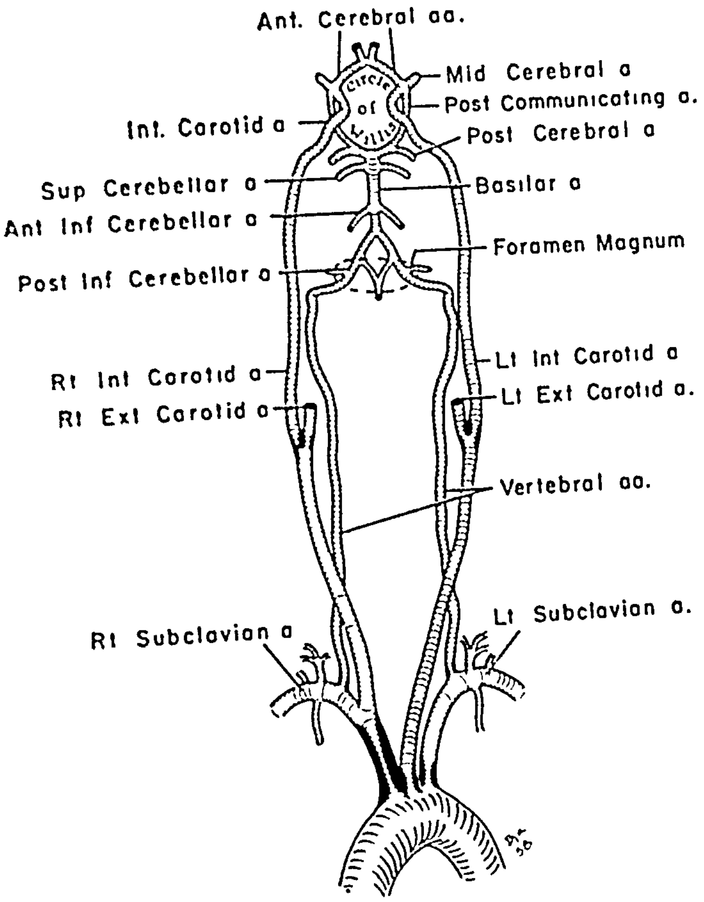

Fig. 1.—Diagram of cerebral circulation with characteristic locations of extracranial atherosclerotic occlusions, demonstrating limits of collateral circulation in presence of multiple lesions.

Report of a Case

A 55-year-old man had been entirely well until June 12, 1958. At this time, while fishing, he suddenly developed total blindness, paralysis of the right side, and partial paralysis of the left side of his body. He was unable to speak and had the feeling of numbness over his entire body. These symptoms quickly became less severe, and within a matter of minutes the patient was able to start the outboard motor and maneuver his boat back to camp.

Upon arriving at the dock some 15 to 20 minutes later, he required assistance in going ashore, and, although his vision had improved, he could not see to the right. He had considerable difficulty expressing himself verbally, felt dizzy, and could not walk straight. After a brief rest in the fishing camp, he was admitted to the local hospital, where he soon became asymptomatic except for headache and difficulty in seeing toward the right.

On physical examination his physician noted an incomplete homonymous hemianopsia of the right side and diminished carotid pulsations in the left side of the neck. Owing to the persistence of these findings, the patient was transferred to the Methodist Hospital, Houston, on June 17, 1958, for consideration of arterial reconstructive surgery. His symptoms of headache and partial blindness were unchanged, and the presence of a fairly complete right-sided homonymous hemianopsia was confirmed at this time. Percutaneous bilateral carotid arteriograms were taken June 18, 1958, with the patient under local anesthesia, with use of 8 cc. of a 50% solution of diatrizoate (Hypaque) sodium in each artery. Results of these studies were entirely normal (fig. 2).

The bilateral nature of the patient's symptoms, which began with total blindness, suggested basilar artery insufficiency and, in view of the studies of Hutchinson and Yates,[4] indicated the necessity of visualizing the entire cervical segment of the vertebral arteries for accurate diagnosis. The method of vertebral arteriography usually used for this purpose was considered inadequate, because in this procedure the vessel is entered in the midcervical region and after the injection of contrast mediums the proximal segment of the vertebral artery is frequently not visualized. For this reason, the following technique for visualizing the entire vertebral artery was developed:

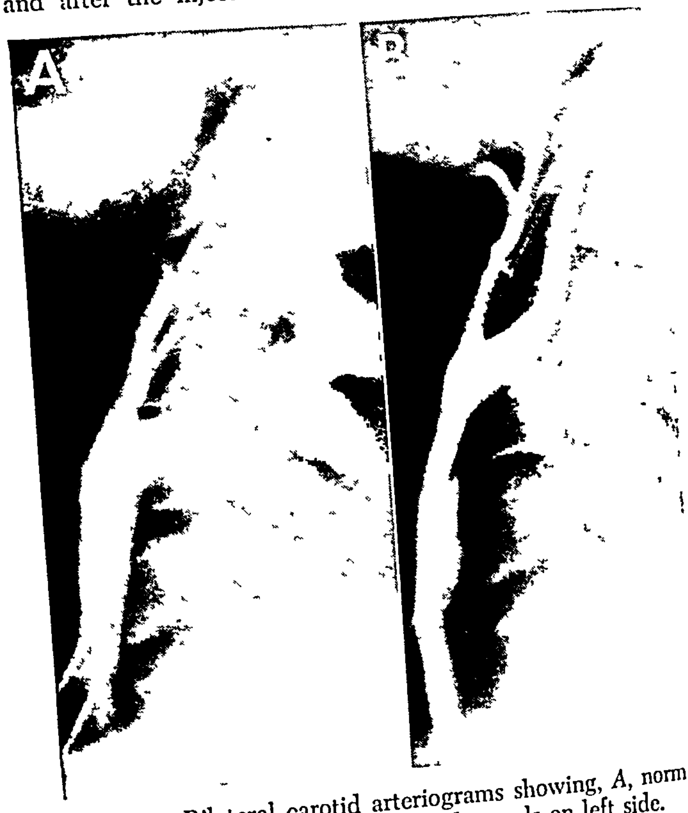

Fig. 2.—Bilateral carotid arteriograms showing, *A*, normal vessels on right side and, *B*, normal vessels on left side.

The patient is placed in the supine position and the neck hyperextended by placing a padded sand bag under the shoulders. The subclavian pulse is palpated in the supraclavicular fossa in the angle made medially by the lateral border of the sternocleidomastoideus muscle and inferiorly by the clavicle. The skin and subcutaneous tissues are infiltrated with procaine (Novocain) hydrochloride solution, and, with a no. 18 Cournand needle, the skin is pierced approximately 2 cm. above the clavicle and 2 cm. lateral to the sternocleidomastoideus muscle. The needle is directed downward and medially in the direction of the subclavian pulsation until the artery is entered (fig. 3). The needle stylet is removed, and a flexible tube is attached to the Cournand needle. With a 30-cc. syringe, 20 cc. of a 50% solution of diatrizoate sodium is injected under vigorous pressure, and toward the end of the injection an anteroposterior roentgenographic exposure is made of the head, neck, and shoulders.

Bilateral subclavian vertebral arteriograms performed in this patient, with the technique described here, revealed complete occlusion of the vertebral artery on the right and partial occlusion on the left limited to a small discrete segment of the vertebral artery at its origin from the subclavian artery (fig. 4). These findings suggested that the occlusive process in the right vertebral artery was probably inoperable owing to organization of the superimposed thrombus and absence of an accessible patent distal segment. There was reason, however, to believe that a more normal basilar artery blood flow could be restored by removing the segmental occlusive process limited to the origin of the left vertebral artery. Accordingly, the following operative procedure was performed on June 19, 1958:

With the patient under local anesthesia an incision was made on the left 3 cm. above and parallel to the clavicle. The clavicular head of the sternocleidomastoideus muscle and the anterior scalenus were severed, exposing the subclavian artery and its branches. Due to the deep mediastinal origin of the vertebral artery in this case, additional exposure was obtained with the patient under general anesthesia when the mediastinum was opened through a combined cervical thoracic incision, splitting the sternum in the midline (fig. 5A). The great vessels originating from the aortic arch were palpated and found to be free of atheromatous lesions. The left subclavian artery and its branches were exposed for several centimeters both proximal and distal to the origin of the vertebral artery (fig. 5B). The vertebral artery was carefully dissected free from surrounding tissues over a distance of 3 cm. A discrete hard mass localized to the first 5 mm. of the vertebral artery could be palpated, and the surrounding tissues were adherent to this area. Although the characteristic signs of an atheromatous lesion were found at the origin of the vertebral artery, the remaining extra spinal segment of this artery was entirely normal. Because of the localized nature of the lesion to such a small segment of artery, the technique of endarterectomy was employed. Temporary occlusion clamps were placed on the subclavian artery both proximal and distal to the origin of the vertebral artery, and temporary ligatures were placed around the thyrocervical and internal mammary arteries. With the vertebral artery temporarily occluded with a soft bulldog clamp to prevent back-bleeding, a longitudinal incision was made in the subclavian artery opposite the origin of the vertebral artery (fig. 5C). The edges of the arterial incision were everted with temporary retraction sutures of fine silk (fig. 5D). From the intraluminal side of the subclavian artery, the origin of the vertebral artery appeared as a dimple with an opening in the center approximately 1 mm. in diameter. A circular incision was made through the intima of the subclavian artery around the edge of the dimple, and through this circular incision a cleavage plane was developed between the involved intima and uninvolved medial layers of the vertebral artery (fig. 5E and F). The occluding hypertrophied intima containing the atheromatous material was removed by retraction of the normal arterial wall back over the specimen (fig. 5F). The restored vertebral artery opening was approximately 8 mm. in diameter, and temporary release of the vertebral artery clamp was associated with a vigorous back flow of blood (fig. 5G). The remaining clamps were temporarily released to permit flushing of debris, following which the subclavian artery incision was repaired with a simple, continuous, through-and-through suture (fig. 5H). Circulation was restored by removal of all clamps and ligatures. A vigorous pulsation was palpated in the vertebral artery, and a subclavian vertebral arteriogram performed after the operation revealed a normal lumen in this artery (fig. 6).

The patient became fully conscious about 30 minutes after completion of the operation and 48 hours later was able to read a newspaper better than at the time of admission to the hospital. Examination by gross confrontation tests at this time showed considerable improvement in the lower quadrant of the visual defect. This improvement was continuous, and, at the time of discharge from the hospital 10 days after operation, the lower quadrant defect had cleared completely and partial clearing was now present in the upper quadrant of the visual fields. Headache did not recur after operation.

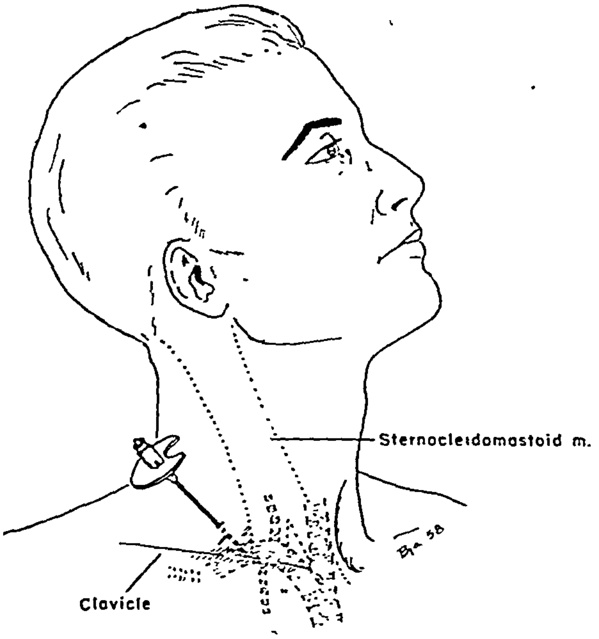

Fig. 3.—Diagram showing anatomic landmarks considered in performance of subclavian vertebral arteriography.

Comment

Although the entire pathological process was not documented in this case, with use of the available evidence and certain assumptions based on the known pattern of atherosclerotic occlusive disease a reasonable explanation is apparent for the clinical picture presented in this case. In view of the frequent bilateral nature of the disease, it is suspected that the patient had had for some time partial occlusion of both vertebral arteries at their origin. With progressive diminution of blood flow to a critical level in the right vertebral artery resulting from gradual severe reduction in luminal size by the atheromatous lesion, thrombosis occurred beyond the occlusion and extended up to the basilar artery at the junction of the two vertebral arteries (fig. 4). Although basilar artery blood flow may have been reasonably normal beforehand, some reduction occurred at the time of thrombosis, because the left vertebral artery was also almost completely obstructed. This sudden reduction in blood flow produced arterial insufficiency of the entire basilar system, resulting in ischemia of the occipital visual cortex. Partial recovery was possible through collateral blood flow and certain cerebral adjustments. Despite this temporary natural recovery, eventually thrombosis of the remaining functioning vertebral artery could be expected in view of the progressive nature of this disease. The resulting total basilar artery insufficiency would probably be inconsistent with survival. The objectives of operation in this case were twofold: first, to remove the obstruction in one vertebral artery and, thus, to restore from this source normal circulation in the basilar arterial system; second, to prevent progression of the disease to complete occlusion by superimposed thrombosis. It was also hoped that by increasing basilar artery circulation more rapid improvement of the residual brain damage would occur. Although the period of follow-up has been short, the gratifying results obtained in this patient appear to justify the treatment employed.

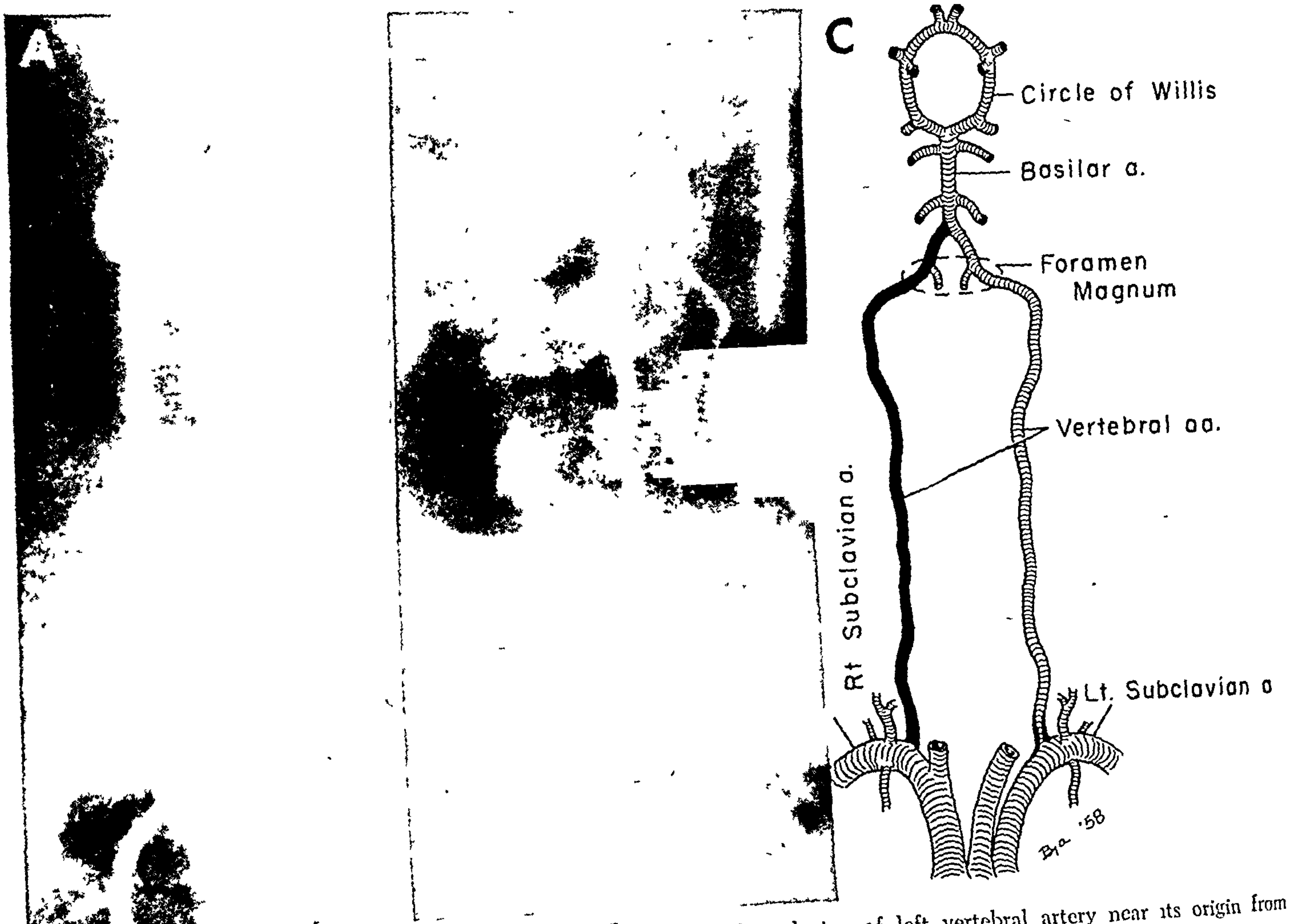

Fig. 4.—A, complete occlusion of right vertebral artery; B, partial occlusion of left vertebral artery near its origin from subclavian artery; C, relationships of occlusions with basilar artery and its branches.

The clinical significance of this case lies in the demonstration of a localized lesion in the vertebral artery causing severe basilar artery insufficiency which was susceptible to both practical roentgenographic diagnosis and direct surgical attack. The excellent results that may be obtained by this therapeutic approach and the high incidence of vertebral artery obstruction in patients with cerebral arterial insufficiency emphasize the need for a more aggressive attack on the entire problem of cerebral arterial insufficiency. To achieve this objective, however, several factors deserve wider appreciation. For one thing, it must be recognized that the obstructive lesion causing strokes is located extracranially in a large percentage of cases. For another, the diagnosis and localization of the occlusive lesion can be made accurately only by arteriography. Finally, the segmental nature of the occlusive lesions in these cases, regardless of location, permits restoration of normal circulation by surgical methods of therapy.

Summary

Atheromatous occlusions of the internal carotid artery in the neck and the great vessels at their origin from the aortic arch have emerged as clinical entities characterized by manifestations of arterial

insufficiency in the distribution of the anterior and middle cerebral arteries. The frequent discrete and localized nature of the occlusive process in such patients has led to the application of reconstructive arterial techniques designed to restore normal cerebral circulation. A large number of these patients have now been successfully treated with these techniques. The anatomic studies of Hutchinson and Yates[4] in patients dying of cerebrovascular accidents showed that the vertebral arteries may be similarly involved in approximately 39% of cases. The clinical significance of these findings is obvious, and the extracranial location of these lesions suggests the possibility of direct surgical attack.

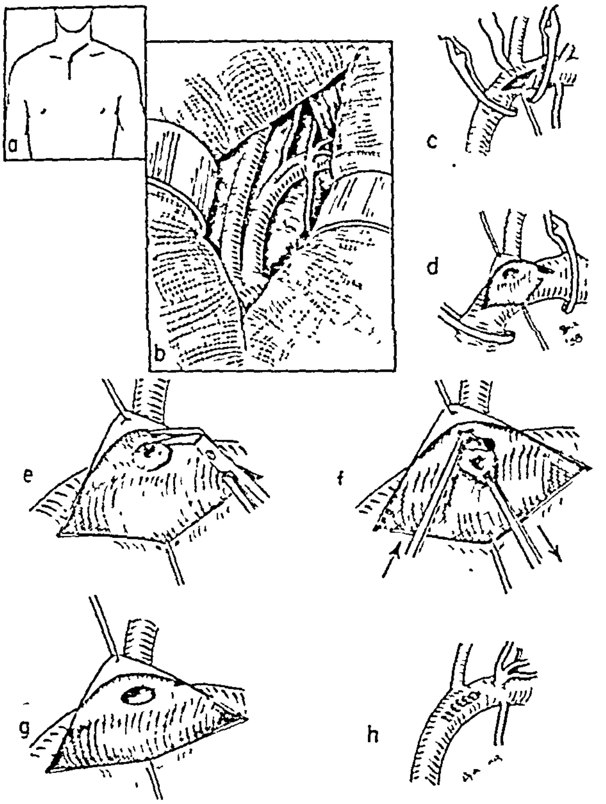

Fig. 5.—Diagrams showing technique of operation: *A*, cervicothoracic incision, splitting sternum, was made, exposing, *B*, great vessels originating on aortic arch, including subclavian artery in region of vertebral artery; *C*, longitudinal incision was made in subclavian artery opposite origin of vertebral artery; incision was retracted with fine silk sutures, exposing, *D*, origin of vertebral artery from lumen of subclavian artery; *E*, circular incision was made in intima of subclavian artery surrounding origin of vertebral artery, and, by development of proper plane of dissection, *F*, occluding tissues were removed, restoring, *G*, normal lumen to origin of vertebral artery; *H*, circulation was restored by repair of subclavian arterial wound with continuous fine silk suture and removal of clamps.

This report is concerned with a patient who was admitted to the hospital five days after the onset of basilar artery insufficiency manifested by visual and peripheral motor disturbances. Vertebral arteriography performed by the direct percutaneous injection of 20 cc. of a 50% solution of diatrizoate (Hypaque) sodium into the proximal subclavian artery revealed complete obstruction of the right vertebral artery and partial occlusion of the left vertebral artery. Reasonably normal basilar artery blood flow was restored in this case by subclavian vertebral endarterectomy. The involved vessels were exposed through an extrapleural combined cervicothoracic incision which split the sternum in the mid-line. After mobilization of the subclavian artery and its branches near the origin of the vertebral artery, temporary occluding clamps were applied. A longitudinal incision was made in the subclavian artery opposite the origin of the vertebral artery. A circular incision was made in the intima of the subclavian artery surrounding the partially obstructed mouth of the vertebral artery. The occluding mass was removed from the vertebral artery through the latter incision. Blood flow was restored by repair of the arterial wounds. After operation, the patient had an uneventful recovery which was associated with continuous improvement in his neurological deficits, indicating the feasibility of operation in patients with basilar arterial insufficiency.

Fig. 6.—Subclavian vertebral arteriogram performed at end of operation, showing restoration of normal lumen in left vertebral artery.

Addendum

Since the preparation of this manuscript, basilar artery circulation has been improved in another patient with vertebral artery occlusion. This patient's symptoms were similar to those reported here; however, complete neurological recovery had occurred at the time of admission to the hospital 10 days after onset. Bilateral subclavian vertebral arteriograms revealed a very small patent vertebral artery on the right and a segmental occlusion of the proximal 4 cm. of the left vertebral artery. Circulation was restored in this patient by use of a small Dacron bypass graft extending from the subclavian artery to the patent vertebral artery distal to the lesion.

This study was supported, in part, by the U. S. Public Health Service and the Houston Heart Association.

References

1. (*a*) De Bakey, M. E.; Morris, G. C., Jr.; Jordan, G. L., Jr.; and Cooley, D. A.: Segmental Thrombo-obliterative Disease of Branches of Aortic Arch, J. A. M. A. **166:**998-1003 (March 1) 1958. (*b*) Eastcott, H. H. G.; Pickering, G. W.; and Rob, C. G.: Reconstruction of Internal Carotid Artery in Patient with Intermittent Attacks of Hemiplegia, Lancet **2:**994-996 (Nov. 13) 1954. (c) Edwards, C., and Rob, C.: Relief of Neurological Symptoms and Signs by Reconstruction of Stenosed Internal Carotid Artery, Brit. M. J. **2:**1265-1267 (Dec. 1) 1956. (*d*) Lyons C., and Galbraith, G.: Surgical Treatment of Atherosclerotic Occlusion of Internal Carotid Artery, Ann. Surg. **146:**487-498 (Sept.) 1957. (*e*) Rob, C., and Wheeler, E. B.: Thrombosis of Internal Carotid Artery Treated by Arterial Surgery, Brit M. J. **2:**264-266 (Aug. 3) 1957. (*f*) Warren, R., and Triedman, L. J.: Pulseless Disease and Carotid Artery Thrombosis: Surgical Considerations, New England J. Med. **257:**685-690 (Oct. 10) 1957.

2. Egas Moniz: L'encéphalographie artérielle, son importance dans la localisation des tumeurs cérébrales, Rev. neurol. **2:**72-90 (July) 1927.

3. Robb, G. P.; and Steinberg, I.: Visualization of Chambers of Heart, Pulmonary Circulation, and Great Blood Vessels in Man: Practical Method, Am. J. Roentgenol. **41:**1-17 (Jan.) 1939.

4. Hutchinson, E. C., and Yates, P. O.: Cervical Portion of Vertebral Artery: Clinico-pathological Study, Brain **79:**-319-331 (June) 1956.

CLINICAL NOTES

EFFICIENT HANDLING OF POISONING EMERGENCIES

T. George Bidder, M.D.
and
Irving Sunshine, Ph.D., Cleveland

Recently the Committee on Toxicology of the American Medical Association published an excellent report on how the general public should handle a poisoning emergency.[1] Fortunately, many of these emergencies involve relatively small amounts of innocuous materials. Occasionally, however, a potentially toxic substance is ingested and prompt medical care is essential. All too frequently this problem has to be treated in hospital emergency rooms by a group of professional people who are occupied in treating many emergency situations of a diverse nature. This report presents information on how one hospital made all the necessary special material for treating poisoning emergencies easily available to the emergency room staff.

The Poison Antidote Cart

A movable locked cart (see figure) was designed to contain all the necessary therapeutic agents. The table lists all the drugs, apparatus, and books that are routinely kept in the cart. These books are excellent reference textbooks that can help solve many of the questions that usually arise in a poisoning situation with respect to either therapy or the chemical composition of household products.

This poison antidote cart has been in constant use for several years. Because all the drugs and equipment necessary for the symptomatic treatment of poisoning emergencies are assembled and readily available, these situations can be handled with promptness and dispatch. There is no need for orderlies and nurses scurrying for unusual but vital drugs and equipment. All necessary measures can be initiated promptly.

Protocol for Handling the Emergency

Recently the problem of efficiently handling poisoning problems in the hospital emergency room was discussed by a group of local physicians called together for that purpose by the Cleveland Academy of Medicine Poison Information Center. In addition to recommending that the fully equipped poison antidote cart be added to their local hospital emergency room's facilities, they suggested the following protocol to guide house officers in the proper handling of an emergency due to chemical poisoning:

1. Treat patient symptomatically and obtain history concomitantly.
2. Contact private physician of the patient.
3. Obtain history of name and composition of poison, amount ingested, time of ingestion, and

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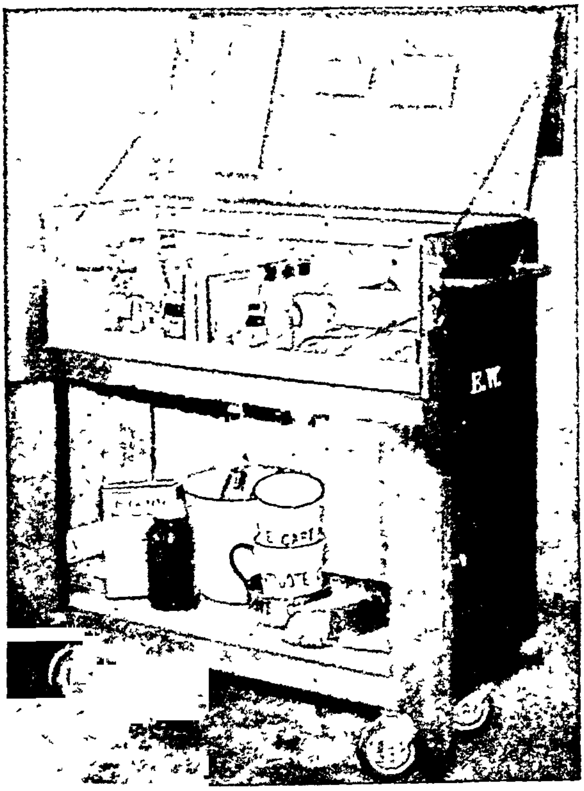
From the Department of Pharmacology, Western Reserve University School of Medicine (Dr. Bidder), and the Cuyahoga County Coroner's Office (Dr. Sunshine).

first-aid treatment given (including drug therapy); have family bring in original container if possible.

4. Emesis should be induced (if not more than four hours have elapsed since ingestion) except in cases of poisoning with acids, alkalies, and volatile hydrocarbons (such as kerosene) and in the unconscious patient.

Emesis is induced with the patient lying flat on his abdomen with the head end of the body inclined downward. Ipecac syrup, 1 teaspoonful to 1 tablespoonful, is given every 15 minutes. Apomorphine hydrochloride, 5 mg. (adult dose) is given subcutaneously only once. This agent is potent but dangerous; do not use in patients with central nervous system depression or in those likely to become depressed from the poison ingested.

A gloved finger is rubbed back and forth in oropharynx. This is an effective, rapid, and simple procedure. Don't get bitten—put a mouth gag in the side of the patient's mouth so that his jaws cannot be closed.



Movable, locked, poison antidote cart designed to contain all necessary therapeutic agents for handling poisoning emergencies.

Less useful ways of inducing emesis include the use of salt water (3 teaspoonfuls of table salt to a glass of warm water) and mustard water (1 teaspoonful of mustard powder to a glass of warm water).

5. Since the efficacy of gastric lavage is debatable, emesis is preferable. If lavage is elected, have the patient lie flat with his head to the side. Use repeated small amounts of fluid up to a total of 500 to 1,000 cc. The use of a large stomach tube is recommended. Do not lavage if ingestion occurred more than four hours previous to the time of treatment or if acid or alkali poisoning is suspected. Saline solution is recommended for lavage.

Books and Equipment on Poison Antidote Cart

DRUGS

- Parenteral pressor agents
  - Amphetamine
  - Mephentermine (Wyamine) sulfate
  - Levarterenol (Levophed) bitartrate
- Parenteral analeptics
  - Caffeine and sodium benzoate
  - Pentylenetetrazol (Metrazol)
  - Picrotoxin
  - Bemegride (Megimide)
- Nalorphine (Nalline) hydrochloride (for parenteral use)
- Chelating agents
  - Dimercaprol (BAL) (for parenteral use)
  - Edathamil calcium-disodium (Versene)
  - Edathamil calcium-disodium ophthalmic solution
- "Universal antidote" (activated charcoal, 2 parts, tannic acid, 2 parts, and magnesium oxide, 1 part)
- Cyanide kit
  - Amyl nitrite
  - Sodium nitrite
  - Sodium thiosulfate
- Oxidizing agent
  - Potassium permanganate (1:10,000, with directions for preparing)
- Atropine sulfate, 0.5-mg. doses for intravenous administration
- Acetic acid, 1%
- Aluminum hydroxide preparation
- Sedatives
  - Thiopental sodium (sodium Pentothal) for intravenous use
- Cholinesterase deinhibitors
  - Pyridine 2-aldoxime methiodide (PAM)

LITERATURE

- Directions for usage of each piece of equipment (posted on lid of cart)

LIST OF CONSULTANTS

- Names and telephone numbers (posted on lid of cart)

EQUIPMENT

- 2 rubber aprons
- 2 adult stomach tubes
- Levin tube, no. 16, 14, and 12
- 2 50-cc. syringes with adaptors
- 2 enamel pitchers with marked graduations, 500-2,000 cc.
- 1 bucket, large
- 2 large emesis basins
- 2 small specimen bottles with tops
- Mineral oil and lubricating jelly
- 1 round compress basin (for ice pan)
- Rubber gloves, special
- 2 wooden mouth gags
- Metal mouth gags, small
- Tourniquets
- File for ampuls
- 2 20-cc. syringes
- Sterile intravenous needles, 20 by 1½ in.*
- Sterile hypodermic needles, 24 by ¾ in.*
- Sterile hypodermic syringes, 2 cc.*
- Sterile hypodermic syringes, 5 cc.*
- Plastic drinking glass

BOOKS

- Gleason, M. N., and others: Clinical Toxicology of Commercial Products, Baltimore, Williams & Wilkins Co., 1957.
- Von Oettingen, W. F.: Poisoning: Guide to Clinical Diagnosis and Treatment, New York, Paul B. Hoeber, Inc., 1953
- Dreisback, R. H.: Handbook of Poisons, Los Altos, Calif., Lange Medical Publications, 1955.
- Pesticide Handbook, edited by D. E. H. Frear, ed. 8, State College, Pa., College Science Publishers, 1956.
- Physicians' Desk Reference to Pharmaceutical Specialties and Biologicals, ed. 11, Oradell, N. J., Medical Economics, Inc., 1957.
- Clinical Memoranda on Economic Poisons, U. S. Public Health Service, publication 476, Technical Development Laboratories, Technology Branch, Communicable Disease Center, Savannah, Ga., 1956.
- Goodman, L. S., and Gilman, A.: Pharmacological Basis of Therapeutics, New York, the Macmillan Company, 1956.

* This equipment should be obtained from rotating sterile hospital supplies By this procedure sterile syringes and needles are always available for immediate use

6. Save vomitus and/or lavage (and urine specimen if it can possibly be obtained) for future examination.

7. Consultants are available for help in their specialty fields. The consultants, their specialties, and their phone numbers appear on a separate

page which is posted on the antidote cart. If problems arise, the intern calls the resident, who in turn may call the poison control officer. If the poison control officer is not available, the resident may call the poison control center or consultant.

8. Admit all patients with questionable cases, particularly those with salicylate poisoning (such as aspirin or wintergreen oil), to the hospital.

The above suggestions are presented to illustrate how one community has begun to attack the problem of accidental poisoning.

2085 Adelbert Rd. (6) (Dr. Sunshine).

References

1. Recommendations of Committee on Toxicology on First-Aid Measures for Poisoning, report to the Council on Drugs, J.A.M.A. **165:**686-687 (Oct. 12) 1957.

COUNCIL ON INDUSTRIAL HEALTH

THE PROBLEM OF PROLONGED AND RECURRENT INDUSTRIAL DERMATITIS

This is the third in a series of reports prepared by the Committee on Occupational Dermatoses of the Council on Industrial Health, American Medical Association.

B. Dixon Holland, M.D., *Secretary.*

Contact dermatitis occurs more frequently than any other disease arising from employment. A wide variety of causes can produce occupational dermatoses, but primary irritant and sensitizing chemicals are responsible for the majority of the cases. As a general rule, the diagnosis of a contact dermatitis can be made by carefully observing the type of lesions present and the areas of involvement. The cause can usually be found by taking a detailed history, with special attention being paid to the time of onset, and the substances to which the individual has been exposed both at work and elsewhere, and by properly performing such tests, including the patch test, as may be necessary. A close observation of the course of the disease is no less important. Cure or alleviation is then accomplished by eliminating contact with the irritant or sensitizing substance if possible, by proper local therapy, the use of protective clothing, by job change, and, sometimes, by the discontinuance of work for varying periods. These measures, if adequately carried out, result in the clearing up of the dermatitis in the majority of instances. There remains, however, a small group of patients who do not recover promptly. Indeed, the skin condition, instead of clearing up, undergoes a prolonged course or recurs repeatedly. Such a course often becomes a source of misunderstanding between the attending physician and the patient, employer, insurance carrier, compensation commission, and family physician.

The high incidence of occupational skin disease constitutes a source of economic loss to the affected workers in the form of interrupted wages, to the company through decreased production and higher insurance rates, and to the community through increased costs which must be added to the price of goods. Those cases of occupational skin disease which require prolonged treatment because of failure to get well add to the above problem of cost. The Committee on Occupational Dermatoses, therefore, is of the opinion that a better understanding on the part of physicians as to the reasons for prolonged or recurrent occupational dermatoses will result in economic benefits to the worker and to the community. The purpose of this paper is to emphasize the chief reasons responsible for failure to bring about a cure in some patients suspected of having occupational dermatoses. These reasons are outlined and discussed below in the order of their importance.

Incorrect Dermatological Diagnosis

Occupational dermatitis develops at the site of primary contact with the causative allergen or irritant. Since the worker's hands and forearms are the areas most commonly exposed to contact agents in the plant, they are the most common sites of first involvement. However, there are several other skin diseases which are prone to affect the hands and forearms, and when one of these diseases is present it can cause confusion in diagnosis, even among experts. Such diseases as nummular eczema, infectious eczematoid dermatitis, dyshidrosis, superficial fungus infection, lichen planus, and psoriasis are all too frequently misdiagnosed as occupational.

Members of the Committee on Occupational Dermatoses are Drs. Donald J. Birmingham (Chairman), Cincinnati; Leonard Weber (Secretary), Chicago; Frank C. Combes, New York; A. Fletcher Hall, Santa Monica, Calif.; James W. Jordan, Buffalo; George Morris, Boston; and Ray O. Noojin, Birmingham, Ala.

It is obvious that, when the diagnosis is incorrect, treatment of the type employed to control occupational dermatitis will be ineffective.

In establishing a diagnosis of contact dermatitis caused by the working environment, a carefully detailed history is most important. It should include a complete description of the worker's job; all substances to which he has been exposed, directly or indirectly; the site of onset of the dermatitis; the course or spread of the condition; the time of its appearance; any therapy that has been employed; and all agents used to cleanse his skin. The history must also include any existing exposure to allergens or irritants outside of working hours.

In correlating the history, the time of onset should be consistent with the time of exposure to the suspected irritant or allergen. For example, a dermatitis generally appears 24 to 72 hours after the last exposure to the causative substance. The areas of skin involvement should be reasonably consistent with the type of exposure to the suspected substance. For example, if a worker degreasing parts develops an eruption from contact with a solvent, one would expect the hands and forearms to erupt first, though other lesions may occur from splashes of the solvent on other areas of exposed skin or on the clothing. On the other hand, if a worker is exposed to an airborne allergen or irritant, one would expect the face, neck, and other areas not covered by clothing to break out first. Occasionally, the time and site of onset of the dermatitis may be consistent with the time and principal areas of exposure to the suspected substance, yet the individual may not have an occupational dermatitis. For this reason attention must be paid to details of exposure to irritants or allergens outside working hours, as previously mentioned.

When the history and physical findings lead one to suspect an allergic contact dermatitis, proper patch testing can be done with the suspected sensitizers encountered at work and elsewhere. Frequently, the patch test will render valuable diagnostic aid in detecting the causative agent in allergic contact dermatoses, but the test must be performed correctly, with the proper dilutions of chemicals borne in mind so as to avoid the use of a primary irritant. A positive reaction to the patch test is not conclusive proof that the individual has an occupational dermatitis, nor does a negative reaction to the test prove that the individual does not have an occupational dermatitis. A careful interpretation of the patch test is mandatory lest the procedure become a substitute for a clinical diagnosis. It must be emphasized that patch tests are not without potential harm, for any patient is apt to have an acute flare-up from the application of the patch test and this can prolong the dermatitis. The proper role of the patch test in diagnosing contact dermatitis of allergic nature has been outlined in detail in a previous publication by this Committee.[1]

Finally, to confirm a diagnosis of occupational dermatitis, it is often necessary to observe the effects of work stoppage and reexposures on the course of the disease.

Failure to Establish Cause

A diagnosis of contact dermatitis may be considered, but discovering the cause of the dermatitis may prove difficult. When an employee does the same work daily, it is easy to obtain a complete history of his job contactants. Some workers, however, go from job to job and give a confusing history of industrial exposure just before or at the time of onset of the dermatitis. For example, maintenance men who work throughout the entire plant are subject to multiple exposures. In such cases, the cause may not be found readily, and the worker, being kept at his job, may thus be exposed to the same substance causing the rash without the cause being known either to the doctor or to the patient.

Failure to Eliminate Cause After Correct Discovery and Diagnosis

Correct diagnosis and discovery of the cause with failure to eliminate the cause completely is a frequent cause of recurrence of occupational dermatitis or its failure to heal completely. There are many underlying factors in this problem, but poor coordination between some medical departments and the production personnel is an outstanding one. For example, a worker is told the cause of his dermatitis and advised to have his job assignment so changed that he no longer contacts the offending allergen or irritant. However, after his skin heals he is put back on the job by the supervisory personnel, with a resultant recurrence of the dermatitis. An equally difficult situation occurs when workers with industrial dermatoses are reluctant to give up skilled jobs for ones that pay less and, consequently, continue working with hazardous materials in spite of medical advice. A complete change of job in the same department sometimes fails because the air, tools, work benches, and even doorknobs contacted daily may be contaminated with the chemicals responsible for the dermatitis.

Sometimes workers completely change their occupation, obtain a new job in a different industry, and still suffer recurrent dermatitis. This can happen when they contact the same allergen or irritant in several different industries. It may also happen when they are exposed to apparently different but chemically related substances. On occasion, the individual may be exposed to the same irritant or allergen at work and away from work; indeed, with some common allergens it is almost impossible to eliminate completely the substances from an individual's environment. It must be remembered that some workers develop a degree of tolerance to their exposures at work and can be treated for their dermatitis and be kept at work, remaining on the job without a recurrence of their dermatitis. Such workers may work for many years without a reappearance of their eruption. In some instances the causative agent cannot be eliminated completely, but, by reducing the degree of exposure, dermatitis can be controlled.

Though designed for preventing contact with irritants and sensitizers, gloves and clothing fail to provide complete protection when they become so contaminated with the allergen or irritant that they constitute a direct source for contact. In like manner, protective ointments create a false sense of security and fail to protect when they are unsuitable for the job or improperly used.

Improper Medication

The use of improper medication in the treatment of occupational dermatitis or injury is probably the most common cause of prolongation of the eruption. Although a course of proper treatment may have been instituted by the attending physician, the patient may become dissatisfied with the slow improvement of his condition and may then experiment with home remedies which often cause an exacerbation, retard healing, or superimpose a new contact dermatitis. The attending physician can do much to prevent this by explaining the course of the disease, its nature, and what treatment should accomplish. It is important that only bland, nonirritating, and nonsensitizing preparations be prescribed in the treatment. Physicians must continually bear in mind that the successful treatment of these diseases is much more dependent on eliciting an accurate work history and detecting the causative agent than on the choice of the topical remedy.

Local therapy for occupational dermatitis, like that for contact dermatitis, is governed by the type of lesion present. Acute erythematous, edematous lesions, with or without vesicles, usually require soothing wet compresses. The use of lotions, liniments, bland ointments, or other preparations which relieve the symptoms will generally depend on the nature and severity of the eruptions, along vith the degree of involvement. Similarly, the use strong applications containing mercury, sulfur, or tar for acute contact dermatitis often results in exacerbation and prolongation of the condition. Steroids in ordinary contact dermatitis are not indicated. They do not cure the dermatitis but only mask it so long as used, and the eruption then reappears as soon as they are stopped. The use of these substances, then, can prolong an occupational dermatitis.

Development of Secondary Infections, Nummular Eczema, or Dyshidrosis

An occupational dermatitis causes disruption of the protective outer layers of the skin and so disturbs the natural barriers to infection that the skin is prone to develop superimposed infections. Common complications, such as folliculitis, furunculosis, cellulitis, and lymphangitis, are readily diagnosed and generally respond quickly to treatment. Conversely, superimposed infectious eczematoid dermatitis and nummular eczema are less easily recognized and treated. Failure to recognize this complication may be a reason that the skin eruption does not clear. The presence of an undermined, active, spreading border is suggestive of infectious eczematoid dermatitis, while circumscribed, patchy, vesicular, crusted areas suggest nummular eczema. When these complications exist, bland therapy, usually effective in uncomplicated dermatitis, fails to achieve satisfactory therapeutic results. Though antibiotics are sometimes of value, they may also reactivate or cause directly vesicular eruptions in the hands of those who are recovering from such, and so can aggravate these eruptions.

Another complication which may accompany occupational dermatitis is dyshidrotic eczema. The exact reason for this complication is not clear, but it is theoretically possible that the edema of the skin, resulting from the dermatitis, causes blocking of the eccrine sweat gland orifices, resulting in the formation of intraepidermic sweat vesicles.

Poor Facilities and Improper Cleansing Agents

The longer an irritant remains on the skin, the greater the possibility of its causing dermatitis. A sufficient number of proper cleansing facilities (showers and wash stands) with an adequate supply of hot and cold running water, so that workers may easily cleanse and remove irritants and allergens from their skin during and after finishing their work, will tend to reduce the incidence of industrial dermatitis. This is most important among workers who are exposed to primary irritants.

The habitual use of poor grade alkaline soap and organic fat solvents, e. g., naphtha, kerosene, and gasoline for cleansing the hands, frequently causes dermatitis among workers. These agents remove the natural oil barrier and in this way make the skin more vulnerable to the action of irritants. Persons who have had occupational dermatitis due to irritants or allergens are prone to exhibit exacerbation from the use of such strong agents for cleansing the skin. Suitable bland cleansers in the form of sulfonated oils and sulfonated alcohols, as well as good-quality conventional soaps, are available as industrial cleansers.

Placing of Dermatitis-Prone Individuals on Hazardous New Jobs

Some skins are more easily affected by primary irritants, while others are more prone to develop cutaneous allergies. Therefore, when an individual has recovered from a severe occupational dermatitis or gives a history of recurrent contact dermatitis from occupational or nonoccupational cause, it is unwise to place him on a new job where he will contact irritant or allergenic chemicals. Plant physicians aware of this are sometimes reluctant to hire a person who has a history of having had a previous industrial dermatitis. These individuals should not be denied employment, but efforts should be made by the attending physician and supervisory personnel to place them on jobs where contact with irritants or allergens is minimal and well controlled.

Cross-Sensitivity

It is known that cross-sensitivity (exposure to different organic chemicals having similar radicals in their molecular structure) can occur to procaine, pontocaine, butesin, ethyl aminobenzoate, sulfonamide, *p*-aminobenzoic acid, aminosalicylic acid, azo dye, and paraphenylene diamines, all of which have a similar amino group in the para position of the benzene ring. Not only substances with similar chemical groups but substances capable of being reduced on the skin to some common chemical group can thus cause a cross-sensitization which eventuates in prolonged or recurrent dermatitis. Accordingly, an individual may develop a dermatitis as a result of exposure to one substance in the plant and suffer a recurrence as a result of contact with a structurally related chemical, either on a new job or in nonoccupational pursuits. This may be a more important cause of prolonged or recurrent dermatitis than our existing knowledge would indicate. Further study on cross reaction may demonstrate a relationship in the form of a common denominator between many supposedly different organic chemicals and thus explain puzzling recurrent dermatitis.

Development of Multiple Reactivities

On rare occasions, an individual develops an occupational dermatitis and then seemingly breaks out after contact with a number of apparently unrelated substances. The cause of this phenomenon is not known, but, when dermatitis persists in spite of the patient's being away from contact with the specific allergen or irritant, one must consider in his case that either nonspecific contactants or cross-reacting allergens might be prolonging the dermatitis.

Malingering

When jobs are easy to find and wages are high, malingering is not common because most employees are not satisfied with the relatively small amounts paid by workmen's compensation for time lost because of industrial disease. However, when jobs are difficult to find, an occupational skin disease may offer a temptation to some individuals to prolong the condition. Sometimes an individual who knows the cause of his dermatitis may reproduce it at will by exposing himself to the causative substance. Older workers, or those with nonoccupational physical impairment which prevents their obtaining new jobs in a new plant, may find it economically advantageous to remain on compensation. Further, industry is sometimes reluctant to hire those who have a history of occupational dermatitis, because of the probability of exacerbations or recurrence of the old dermatitis on a new job. This can constitute a cause for malingering.

It is difficult to determine how much of a part malingering plays in the recurrence or prolongation of industrial disease; though frequently suspected, it is difficult to prove. Rehabilitation and proper job placement, along with better compensation laws, should do much to prevent malingering.

Miscellaneous

There are other factors peculiar to each case which undoubtedly affect the recovery of the patient, namely, an active focus of infection elsewhere, active fungus infection of the feet, worry about various economic and domestic problems, and interference with the attending physician by adjustors or other physicians. Patients with an atopic background or a constitutional skin disease, such as psoriasis, make treatment and recovery of the occupational dermatitis a difficult problem. The conscientious attending physician recognizes these problems and eliminates them when possible, but often some of them are beyond his control.

Summary and Conclusions

Most cases of occupational dermatitis are easily managed by proper diagnosis and appropriate treatment, but in some cases the dermatitis recurs repeatedly or fails to heal after conventional therapy. The reasons for this, in the opinion of the Committee on Occupational Dermatoses, are (1) incorrect dermatological diagnosis, (2) failure to recognize the cause, (3) failure to eliminate the cause when recognized, (4) improper treatment, (5) failure to recognize secondary infections, (6) lack of personal cleanliness by the worker because of poor cleansing facilities and cleansing agents, (7) placement of dermatitis-prone individuals on potentially hazardous jobs, (8) development of cross-sensitivity, (9) development of multiple reactivities, (10) malingering, and such other factors as active focus of infection, presence of fungus disease, and presence of constitutional skin disease.

References

1. Role of the Patch Test in Contact Dermatitis, report of the Committee on Occupational Dermatoses of the Council on Industrial Health, J. A. M. A. **156**:497-499 (Oct. 2) 1954.

2. Morris, G. E.: Why Doesn't Worker's Skin Clear Up? Analysis of Factors Complicating Industrial Dermatoses, A. M. A. Arch. Indust. Hyg. **10**:43-49 (July) 1954.

COUNCIL ON FOODS AND NUTRITION

SYMPOSIUM ON FACTORS INVOLVED IN FORMATION AND DISEASES OF BONE

A symposium, "Factors Involved in Formation and Diseases of Bone," will be held in Madison, Wis., Oct. 16, 1958. This symposium will be sponsored by the Council on Foods and Nutrition with the cooperation of the Medical School, University of Wisconsin; Dane County Medical Society; and Charitable, Educational, and Scientific Foundation of the State Medical Society of Wisconsin. This program will be held in the auditorium (Room 230) of the Service Memorial Institutes, University of Wisconsin. The meeting will be open to all interested persons, and there will be no registration fee. The following program has been arranged by authorization of the Council.

Philip L. White, Sc.D., *Secretary.*

Morning Session

Moderator

Dr. J. Z. Bowers, Dean, School of Medicine, University of Wisconsin

8:30 a. m.: Registration

9:15 a. m.: Welcome

Dr. C. A. Elvehjem, President, University of Wisconsin

9:30 a. m.: *Historical Background of Vitamin D*

Dr. H. T. Scott, Director of Biological Laboratory, Wisconsin Alumni Research Foundation

9:50 a. m.: *Mode of Action of Vitamin D*

Dr. H. F. De Luca, Instructor, Department of Biochemistry, University of Wisconsin

10:20 a. m.: *Clinical Indications for Use of Vitamin D Preparations*

Dr. D. W. Smith, Instructor, Department of Pediatrics, School of Medicine, University of Wisconsin

11:00 a. m.: *Factors Influencing Tooth Formation and Repair*

Dr. W. D. Armstrong, Chairman, Department of Physiological Chemistry, University of Minnesota

11:45 a. m.: *Questions and Discussion*

Afternoon Session

Moderator

Dr. R. N. Allin, Assistant Clinical Professor of Medicine, School of Medicine, University of Wisconsin

2:00 p. m.: *Clinical Considerations in Bone Formation and Repair*

Dr. D. M. Angevine, Chairman, Department of Pathology, School of Medicine, University of Wisconsin; Dr. L. W. Paul, Chairman, Department of Radiology, School of Medicine, University of Wisconsin

2:50 p. m.: *Lathyrism and Bone Disease*

Dr. I. V. Ponseti, Associate Professor of Orthopedic Surgery, School of Medicine, State University of Iowa

Discussion

Dr. F. M. Strong, Professor of Biochemistry, University of Wisconsin; Dr. J. J. Lalich, Professor of Pathology, School of Medicine, University of Wisconsin

3:40 p. m.: *Fall-out and Radioactive Strontium Utilization in Human Bone*

Dr. Willard Libby, Commissioner, U. S. Atomic Energy Commission

GRADUATE MEDICAL EDUCATION IN THE UNITED STATES

ANNUAL REPORT AND DIRECTORY OF APPROVED INTERNSHIPS AND RESIDENCIES IN THE UNITED STATES; AND THE REQUIREMENTS OF EXAMINING BOARDS IN THE MEDICAL SPECIALTIES. PREPARED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Arthur N. Springall, M.D., John Hinman, M.D., and Willard V. Thompson, M.D.

ANNUAL REPORT

The 32nd Annual Report on Internships and Residencies is submitted herewith, consisting of detailed information and statistical data on all intern and residency programs approved by the Council. Its primary purpose is to provide this information for recent medical school graduates beginning their professional careers and desiring to undertake graduate medical education and training. According to the present policy of the Council, approval is limited to programs in hospitals located in the continental United States, the Canal Zone, Hawaii, and Puerto Rico.

The report is based on detailed information furnished by each approved hospital. The data in the tables represent the intern and residency situation on Sept. 1, 1957. In many instances, these data vary from the statistics published in the Directory of Approved Internships and Residencies, as the latter refer to the internship and residency appointments beginning July 1, 1959.

Detailed explanations and interpretations are given on published statistical tables regarding internships and residencies; the function and results of the National Intern Matching Program are included and also information concerning the several intern and residency review committees.

Following the statistical report and interpretations is the Directory of Approved Internships and Residencies. In addition to the name and address of each hospital approved for internship, information is given concerning hospital control, number of beds, number of annual admissions, autopsy rate, length of internship, stipend, and number and types of internships offered. A list of Canadian internships approved by the Canadian Medical Association is included.

The residency section consists of information on residency programs in the various specialties in hospitals approved for training. Supplemental to the data presented, which are similar to information given in the internship section, the names of the chiefs of services are listed. The geographical listing by state and city indicates the approved residencies in specialties which are offered by each hospital.

The Council is grateful for the cooperation and assistance of the medical staffs and the administrators of hospitals listed. This report is made possible by their assistance in furnishing the data required.

The following organizations collaborated with the Council in approving residency programs:

- Advisory Board for Medical Specialties
- American Academy of General Practice
- American Board of Anesthesiology
- American Board of Dermatology
- American Board of Internal Medicine
  - Subspecialty Board on Allergy
  - Subspecialty Board on Cardiovascular Disease
  - Subspecialty Board on Gastroenterology
  - Subspecialty Board on Pulmonary Diseases
- American Board of Neurological Surgery
- American Board of Obstetrics and Gynecology
- American Board of Ophthalmology
- American Board of Orthopedic Surgery
- American Board of Otolaryngology
- American Board of Pathology
- American Board of Pediatrics
  - Subspecialty Board on Allergy
- American Board of Physical Medicine and Rehabilitation
- American Board of Plastic Surgery
- American Board of Preventive Medicine
- American Board of Proctology
- American Board of Psychiatry and Neurology
- American Board of Radiology
- American Board of Surgery
- American Board of Urology
- Board of Thoracic Surgery
- American College of Physicians
- American College of Surgeons

The annual report is available to medical students, interns and residents, hospital administrators, medical educators, and other individuals and organizations desiring information on graduate medical education. The entire report is reprinted as the Directory of Approved Internships and Residencies. Copies of this reprint may be obtained from the Council.

INTERNSHIP

During the past 10 years, there has been a gradual increase in the number of approved internships. Since 1952, the number of hospitals offering ap-

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Mrs. Helen Neitzel and Mrs. Mildred Papak were responsible for much of the detail work in the preparation of the lists of approved internships and residencies, and the staff of the IBM Service was responsible for the statistical tabulations.

proved intern-training programs has varied little more than 2% annually. Comparison of figures for the last 10 years may be made by reference to table 1, which indicates the number of hospitals offering approved internships and the number of positions offered. For the intern year 1957-1958, the number of hospitals offering intern training was 867, an increase of 2% from the figure for the preceding year. Positions offered increased 3% to a total of 12,325. Included in these statistics are figures submitted by hospitals in territories and possessions of the United States—one in the Canal Zone, four in Hawaii, and seven in Puerto Rico.

TABLE 1.—*Approved Hospitals and Internships, 1949-1958*

	No. of Hospitals	No. of Internships
1949	807	9,124
1950	799	9,398
1951	828	10,044
1952	865	11,467
1953	856	11,006
1954	844	10,624
1955	850	11,648
1956	867	11,616
1957	852	11,895
1958	867	12,325

The disparity between the number of approved intern positions and the number of American medical school graduates available to fill them continues to increase. Approximately 7,000 students were graduated from American medical schools in 1957 as compared with 12,325 positions to be filled. The discrepancy is about 5,000 internships which either remained vacant or were filled by graduates of foreign medical schools. The average number of intern positions for each hospital has increased during the past 10 years from 11.3 to 14.2.

TABLE 2.—*Number of Internships, by Type of Service, 1957-1958*

Type of Internship	No. of Approved Programs	No. of Internships: Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled
Rotating general	822	8,878	1,945	82
Other rotating	20	58	6	91
Totals	842	8,936	1,951	82
Mixed	34	158	18	89
Straight				
Internal medicine	79	587	52	92
Surgery	60	331	50	87
Pediatrics	50	149	37	80
Pathology	28	37	19	66
Totals	217	1,104	158	87
Grand totals	1,093*	10,198	2,127	83

* Number of intern training programs in 867 approved hospitals.

Internships, by Type of Service

The following three types of internships are approved by the Council: (1) rotating, which includes training on the medical, surgical, pediatric, and obstetric services; (2) mixed, offering training in two or three of the four major clinical services; and (3) straight, which provides training on a single service. Although there is a numerical increase of 430 in intern positions, the relative distribution of these three types is approximately the same as for the preceding year—rotating internships 87.6%, mixed internships 1.6%, and straight internships 10.8%.

Table 2 indicates the breakdown of internships according to type of service and shows the number and percentage of positions filled on Sept. 1, 1957, for each type. There is little variation in these statistics from those of the previous year. The percentage filled on stated date were rotating 82%, mixed 89%, straight 87%. Of the straight internships, those in medicine showed the highest rate of occupancy 92%, and the lowest rate was for pathology, which was 66%. The status of the straight obstetrics-gynecology internship was clarified too late for interns to be reported on service on Sept. 1, 1957.

TABLE 3.—*Number of Internships, by Type of Hospital Control 1957-1958*

Control	No. of Approved Hospitals	No. of Internships: Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled
Federal				
U. S. Army	10	223*	3	99
U. S. Navy	14	193	0	100
U. S. Air Force	1	23	1	96
U. S. Public Health Service	7	84	0	100
Veterans Administration	6	48	47	50
Other federal	3	43	6	88
Totals	41	614	57	92
Governmental (nonfederal)				
State	31	840	127	87
County	36	877	125	84
City	49	1,327	167	89
City-County	17	320	68	82
Totals	133	3,364	487	87
Nongovernmental				
Church	316	2,566	749	77
Nonprofit corporations	368	3,614	811	82
Totals	684	6,180	1,560	80
Proprietary				
Partnership	1	2	6	25
Corporations unrestricted as to profit	8	38	17	69
Totals	9	40	23	63
Grand totals	867	10,198	2,127	83

* Includes 60 positions assigned to the U. S. Air Force.

Although not indicated in the table, the majority of straight internships are offered in medical school affiliated hospitals. On Sept. 1, 1957, there were 1,093 approved intern programs in 867 hospitals, offering 12,325 internships. Of this number, 10,198, or 83%, were filled. The same percentage (83%) of positions filled was published for 1956 and for 1955.

Internships, by Type of Hospital Control

Table 3 classifies internships according to type of hospital control. The largest group in this classification is comprised of the nongovernmental hospitals, of which there are 684, or 78.9%. The governmental (nonfederal) hospitals numbered 133 (15.3%); federal hospitals were 41 (4.7%); and the proprietary hospitals, the smallest group, included 9 (1%).

The occupancy rate (as of Sept. 1, 1957) for these hospitals varied from a high of 92% in the case of the federal hospitals to a low of 63% for the proprietary group. The rate for governmental (nonfederal) institutions was 87%, and that for the nongovernmental group was 80%.

TABLE 4.—*Number of Internships, by Medical School Affiliation and Bed Capacity, 1957-1958*

		No. of Internships		
Classification	No. of Approved Hospitals	Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled
Nonaffiliated				
Less than 200 beds	138	686	163	81
200-299	260	1,796	560	76
300-499	200	2,109	514	80
500-over	58	1,114	158	88
Totals	656	5,705	1,395	80
Major teaching				
Less than 200 beds	10	42	10	81
200-299	13	160	16	91
300-499	51	910	151	86
500-over	66	2,688	356	88
Totals	140	3,800	533	88
Minor teaching				
Less than 200 beds	13	43	27	61
200-299	24	155	84	65
300-499	24	282	53	84
500-over	10	213	35	86
Totals	71	693	199	78
Grand totals	867	10,198	2,127	83

The largest numerical increase in this group of hospitals appeared in the nongovernmental group; there were 684 hospitals offering 7,740 positions as compared with 670 hospitals providing 7,393 internships in 1956.

In the individual federal services, the Navy hospitals and Public Health Service hospitals reported all positions filled on Sept. 1, 1957; the Army showed 99% filled; the Veterans Administration hospitals were 50% filled. The figure of 223 positions filled shown by the Army includes 60 positions occupied by members of the Air Force; this number is in addition to the 23 interns shown in the single Air Force hospital that is approved for intern training.

The average number of interns on duty per hospital is 11.8 as compared with 11.6 for the preceding year. Federal hospitals averaged 14.9 interns per hospital, governmental (nonfederal) 25.3, non-

TABLE 5.—*Number of Internships, by Census Region and State, 1957-1958.*

		No. of Internships		
Census Region and State	No. of Approved Hospitals	Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled
New England				
Connecticut	22	205	12	92
Maine	4	19	9	68
Massachusetts	38	370	55	77
New Hampshire	1	14	..	100
Rhode Island	7	52	16	76
Vermont	2	20	1	95
Totals	74	680	93	88
Middle Atlantic				
New Jersey	41	427	47	90
New York	107	1,714	138	93
Pennsylvania	78	650	268	71
Totals	226	2,791	453	86
East North Central				
Illinois	55	730	89	89
Indiana	16	88	98	42
Michigan	38	480	124	80
Ohio	54	656	138	83
Wisconsin	22	162	72	69
Totals	185	2,116	521	80
West North Central				
Iowa	8	72	6	92
Kansas	6	80	11	88
Minnesota	15	189	40	82
Missouri	27	314	115	73
Nebraska	9	50	30	63
North Dakota	4	13	9	59
South Dakota	3	19	5	79
Totals	72	737	216	77
South Atlantic				
Delaware	3	21	13	62
District of Columbia	11	221	12	95
Florida	15	192	28	87
Georgia	16	141	81	64
Maryland	21	277	52	84
North Carolina	13	135	64	68
South Carolina	7	90	13	87
Virginia	18	203	25	89
West Virginia	10	61	19	76
Totals	114	1,341	307	81
East South Central				
Alabama	9	81	45	64
Kentucky	9	87	24	79
Mississippi	3	23	16	59
Tennessee	15	195	46	81
Totals	36	386	131	75
West South Central				
Arkansas	3	36	17	68
Louisiana	10	240	12	95
Oklahoma	7	67	27	71
Texas	27	374	72	84
Totals	47	717	128	85
Mountain				
Arizona	5	39	20	66
Colorado	12	151	11	93
Montana	2	6	2	75
New Mexico	1	8	2	80
Utah	7	67	19	78
Totals	27	271	54	83
Pacific				
California	51	742	176	81
Oregon	7	94	6	94
Washington	16	166	20	89
Totals	74	1,002	202	83
Territories and Possessions				
Canal Zone	1	15	..	100
Hawaii	4	64	11	85
Puerto Rico	7	78	11	88
Totals	12	157	22	88
Grand totals	867	10,198	2,127	83

governmental 9.0, and proprietary hospitals 4.3. These figures do not vary appreciably from those for 1956.

For the past three years the number of intern positions filled has increased from 9,603 in 1955 to 9,893 in 1956 to 10,198 in 1957. While this numerical increase is present, it should be noted that the percentage of intern positions that has been filled each of these years has remained steady at 83%.

TABLE 6.—*Internship Hospitals with Highest Autopsy Rates, 1957*

		%
	Federal	
1.	Letterman Army Hospital, San Francisco	93
2.	Fitzsimons Army Hospital, Denver	92
3.	Brooke Army Hospital, Fort Sam Houston, San Antonio, Texas	91
4.	U. S. Army Hospital, Fort Benning, Ga	90
5.	U. S. Naval Hospital, Bethesda, Md	90
6.	Madigan Army Hospital, Fort Lewis, Tacoma, Wash	90
7.	Gorgas Hospital, Ancon, Canal Zone	89
8.	U. S. Naval Hospital, Jacksonville, Fla	89
9.	William Beaumont Army Hospital, El Paso, Texas	89
10.	Walter Reed Army Hospital, Washington, D. C	88
11.	U. S. Naval Hospital, Oakland, Calif	87
12.	Veterans Administration Hospital, Salt Lake City	87
13.	U. S. Naval Hospital, Oceanside, Calif	86
14.	U. S. Naval Hospital, San Diego, Calif	86
15.	U. S. Naval Hospital, Great Lakes, Ill	86
16.	U. S. Public Health Service Hospital, New Orleans	86
17.	U. S. Public Health Service Hospital, Baltimore	86
18.	Valley Forge Army Hospital, Phoenixville, Pa	85
19.	U. S. Public Health Service Hospital, Seattle	85
20.	U. S. Public Health Service Hospital, Boston	82
	Nonfederal	
1.	Children's Orthopedic Hospital, Seattle	96
2.	Aguadilla District Hospital, Aguadilla, P. R	94
3.	Children's Hospital, Buffalo	93
4.	Children's Hospital, Los Angeles	90
5.	Colorado General Hospital, Denver	89
6.	University of Illinois Research and Education Hospitals, Chicago	89
7.	University of California Hospital, Los Angeles	87
8.	University of Minnesota Hospitals, Minneapolis	86
9.	University of California Hospitals (Herbert C. Moffitt Hospital), San Francisco	85
10.	Glockner-Penrose Hospital, Colorado Springs, Colo	85
11.	Children's Medical Center, Boston	84
12.	St. Louis Children's Hospital, St. Louis	84
13.	St. Peter's General Hospital, New Brunswick, N. J	84
14.	Mary Hitchcock Memorial Hospital, Hanover, N. H	83
15.	El Paso General Hospital, El Paso, Texas	83
16.	Mary Fletcher Hospital, Burlington, Vt	82
17.	Milwaukee Children's Hospital, Milwaukee	81
18.	Boston Floating Hospital, Boston	81
19.	Blodgett Memorial Hospital, Grand Rapids, Mich	80
20.	Evanston Hospital, Evanston, Ill	80

Internships, by Medical School Affiliation and Bed Capacity

In table 4, division of hospitals into three categories is made, classification being based on the degree to which medical schools utilize these hospitals for undergraduate medical education. A "major teaching hospital" is considered by the medical school as a major unit in its undergraduate clinical clerkship program. A "minor teaching hospital" indicates that the hospital is used to a limited extent for undergraduate training. Hospitals which are not designated by a medical school as participating in such a program are termed "nonaffiliated hospitals."

There are 140 major teaching hospitals, constituting 16% of the total number. These hospitals offered 4,333 intern positions, of which 88% were filled on Sept. 1, 1957. The 71 minor teaching hospitals constituted 8% of the total, and were 78% filled. The largest group is comprised of the nonaffiliated hospitals, which number 656 and make up 76% of the total number. Of the 7,100 positions, 80% were occupied on Sept. 1, 1957. There has been an increase of 20 hospitals in this group since the preceding year.

On the basis of grouping by bed capacity, it is observed that the occupancy rate for hospitals of 200 beds and under and for hospitals of 200-299 beds is the same, 79%. Of the positions offered by hospitals having 300-499 beds, 83% were filled; and 88% of the positions offered by hospitals of over 500 beds were filled. As compared with similar statistics for 1956, there is an increase of 2% in the occupancy rate in the first three groups for 1957 and a decrease of 2% in hospitals having more than 500 beds for the same period.

Internships, by Census Region and States

Distribution of internships by geographical location appears in table 5, with numbers of positions filled and percentage occupancy given for each region and individual state.

Hospitals in United States territories and possessions and those in the New England area showed the highest rate of occupancy, 88%, on Sept. 1, 1957. The region having the lowest rate of occupancy was the East South Central area with 75%. Individual states with a rate of 90% or above were Canal Zone 100%, New Hampshire 100%, District of Columbia 95%, Louisiana 95%, Vermont 95%, Oregon 94%, New York 93%, Colorado 93%, Connecticut 92%, Iowa 92%, and New Jersey 90%. States having the lowest rates were Indiana, North Dakota, and Mississippi.

As has been noted in previous years, the Middle Atlantic states (New Jersey, New York, and Pennsylvania) offer more than one-quarter of all approved internships, and more than one-quarter of the interns serving on Sept. 1, 1957, were located in these three states.

There are still three states which do not offer approved intern training—Idaho, Nevada, and Wyoming.

Autopsy Rates

Table 6 is a listing of the 20 federal and 20 nonfederal hospitals having the highest autopsy rates for the past year. These hospitals are to be commended for their high autopsy rates, as the rate is considered to indicate the interest of the staff in medical education and in the scientific progress of medicine.

Thirteen of the 20 federal hospitals were listed last year, and 13 of the 20 nonfederal hospitals also were listed last year.

Hospitals offering approved intern training programs which fall below the 25% autopsy rate are being encouraged to raise the rate, as a rate below this minimum figure may be the basis for withdrawal of approval.

Internship Stipends

A study of the monthly stipends offered interns indicates that there has been an appreciable increase during the last several years. In order for a comparison to be made of present and past stipends, the average monthly stipend for interns serving in both affiliated and nonaffiliated hospitals was calculated, the upper level of the stipend range being used in order to be consistent with the method of calculation during previous years.

For affiliated hospitals, the average cash stipend paid in 1954 was $87; in 1955, $121; in 1956, $141; and for the year beginning July 1, 1957, $155. These figures show an increase of $14 over the previous year. Nonaffiliated hospitals showed a similar increase—in 1954, $136; in 1955, $169; in 1956, $177; and in 1957-58, $197, an increase of $20 over the preceding year.

The graph indicates the comparison of the stipend paid by the affiliated and the nonaffiliated hospitals. Cash stipend was furnished by all hospitals. This graph corresponds to the graph published for 1956-1957. Federal hospitals are not included in any of these stipend calculations.

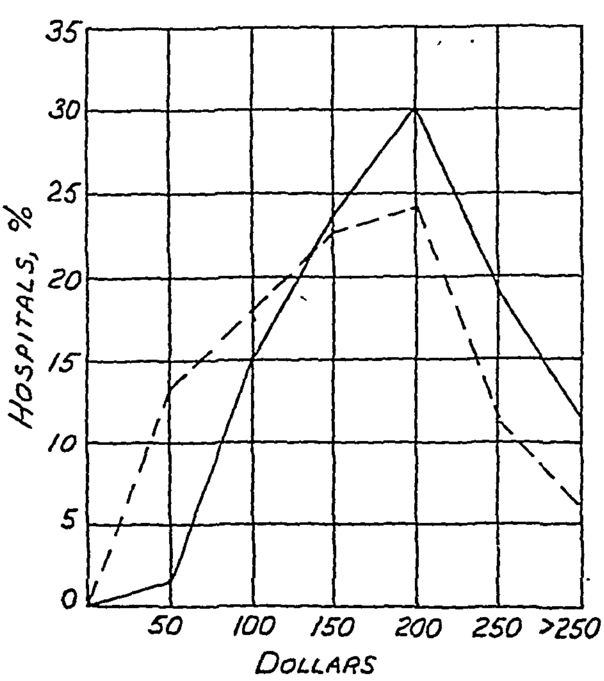
In addition to the cash monthly stipend, 69% of the affiliated hospitals furnished full maintenance; 20% furnished partial maintenance; and 11% furnished no maintenance. In the nonaffiliated group, 83% offered full maintenance; 14% offered partial maintenance; and 3% indicated that no maintenance was furnished.

The stipend paid by the nonaffiliated hospitals averaged $42 more than that given by the affiliated hospitals. The letters FM and PM, as used in the listings of internships, refer to "full maintenance" and "partial maintenance" respectively.

National Intern Matching Program

The National Intern Matching Program continues to serve as the central clearing agency for hospitals seeking interns and for medical students desiring internships. For the past seven years, hospitals approved for intern training by the Council on Medical Education and Hospitals and medical students seeking first year internships have used the NIMP as the official agency for intern procurement. The plan gives complete freedom of choice to both hospitals and students and has received continued support from both groups.

Hospitals approved by the Council submit a Hospital Agreement to the program in which they agree to interview only students who participate in the program and to accept all interns matched to them. Students submit similar agreements, stating they will apply only to participating hospitals and will accept the hospital to which they are matched. Hospitals and students make contact with each other by means of the NIMP directory. Hospitals receive a directory of all participating students, and students receive a hospital directory in which are listed all participating hospitals and the type and number of internships each offers. Hospitals are free to interview as many applicants as possible, using any means of evaluation they desire.



Monthly internship stipends, with federal hospitals excluded. Solid line indicates nonaffiliated hospitals (627), dashed line, affiliated hospitals (199). Abscissa gives upper level of stipend range.

The Matching Program has matched more than 42,000 students with no reported error to date. The policies and general management of the program are governed by the organizations most interested

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Ward Darley, M.D., Executive Secretary, National Intern Matching Program, submitted the section entitled "National Intern Matching Program."

in medical education at the intern level. These organizations include, in addition to the Council on Medical Education and Hospitals, the American Hospital Association, the Association of American Medical Colleges, the Catholic Hospital Association, the American Protestant Hospital Association, and the Student American Medical Association. Further assistance is given by liaison representatives from the Army, Navy, Air Force, and the Public Health Service.

The program covers internships beginning April 1 and Dec. 31. In Program VII for 1958 internships, 819 hospitals offered 11,958 positions, while 7,131 students participated in the program. Of this number, 6,734 (94%) were matched. 88% of the matched students went to hospitals of their first or second choice. Conversely, 89% of the hospitals received medical students whom they had selected as first or second choice.

All of the above figures include those graduates of foreign medical schools who participated in Program VII. Out of the 376 participating, 224 were matched. For Program VIII (the next matching), NIMP will require certification by the Educational Council for Foreign Medical Graduates. This will undoubtedly reduce the number of foreign graduates participating in the next matching.

Internship Review Committee

The Internship Review Committee was formed in 1954 for the purpose of recommending to the Council action on intern training programs, following review of surveys submitted by the Field Staff of the Council. The Committee is also authorized to make recommendations to the Council for changes in internship requirements and for policy changes regarding intern education.

Membership on the Committee includes representatives of the Council on Medical Education and Hospitals, the Association of American Medical Colleges, the American Hospital Association, the Federation of State Medical Boards of the United States, and the American Academy of General Practice.

The primary objective of the Committee is the continuous improvement of the standards of medical education at the internship level. It allows a reasonable degree of flexibility in the interpretation of the *Essentials of an Approved Internship*; it urges the development of new ideas; and it encourages proper experimentation. It also gives a hospital having deficiencies in its training program a reasonable period of time in which to correct these deficiencies before approval of the internship is discontinued.

RESIDENCY REVIEW AND CONFERENCE COMMITTEES

The Residency Review and Conference Committees essentially represent a cooperative partnership through which the Council, the various specialty boards, the American College of Surgeons, the American College of Physicians, and the American Academy of General Practice are endeavoring to conduct objective and constructive programs of approval in graduate medical education. These committees are delegated authority by their parent organizations to approve residency training programs and authorize the listing of such programs in the annual *Internship and Residency* Number of THE JOURNAL.

Since they represent a liaison partnership with responsibilities for approval of residency training delegated to them by their parent organizations, it is important that any major changes in policy by a parent organization which might alter materially program approval are instituted only after discussion and mutual agreement. When the committees find it necessary to make recommendations regarding changes in standards, such changes are referred to the parent organizations for approval prior to implementation.

The objective of these committees, composed of representatives of the Council and other appropriate sponsoring bodies, is to insure that the best possible graduate medical education and training are provided at the residency level. The committees encourage the staffs of hospitals operating residency programs to maintain the training standards at a high level and to strive continually to elevate these standards of graduate medical education.

Bipartite committees, composed of representatives of the Council and the specialty board concerned, are those in anesthesiology, dermatology, neurological surgery, ophthalmology, orthopedic surgery, physical medicine, preventive medicine, proctology, psychiatry and neurology, radiology, and urology. The committees in surgery, plastic surgery, otolaryngology, and obstetrics-gynecology include representatives from the American College of Surgeons, in addition to the Council and the specialty boards. The committee for internal medicine includes representatives of the American College of Physicians, and the committee on pediatrics includes representatives of the American Academy of Pediatrics. The general practice committee is composed of members of the Council and the American Academy of General Practice.

The committee on obstetrics-gynecology has been established during the past year. There is no committee in pathology or in thoracic surgery.

The internal medicine committee is also responsible for the subspecialties of allergy, cardiovascular disease, gastroenterology, and pulmonary diseases. The committee on pediatrics includes the subspecialty of pediatric allergy. The subspecialties of aviation medicine, occupational medicine, and public health are the responsibility of the committee on preventive medicine. Committees meet at stated intervals, from once annually to three or four times annually.

Residencies by Specialty

In table 7 is presented the breakdown of the number of residencies into the particular specialties. Data concerning the number of first year appointments and the total number of appointments are quoted for each specialty, also the number of appointments filled and vacant as of Sept. 1, 1957, together with the percentage filled in each instance. The number of approved programs offered increased from 5,134 for the previous year to 5,299 this year. The total number of residencies offered by all programs was 30,595, an increase of 6% over the number of positions offered last year. Of this number 12,939, or approximately 40%, were first year residencies.

Training is offered in 26 specialties and in general practice. The residencies in contagious diseases and in malignant disease have been discontinued. While the majority of residency training programs are given in hospitals, some (in aviation medicine, occupational medicine, and public health) are given in other organizations or institutions.

The specialty offering the largest number of residency positions was surgery, with 5,924 positions offered; this was followed by internal medicine, with 5,401 positions offered. Obstetrics-gynecology held the third position with 2,525 residencies. The positions offered by these three specialties accounted for approximately one-third of the total number of residencies. The residencies in aviation medicine, dermatology, obstetrics-gynecology, ophthalmology, and surgery showed an occupancy rate of 90% or higher. The rate of 39% for public health was the lowest.

The over-all occupancy rate for all residencies was 82%, which was slightly higher than the figure of 81% for the previous year.

Residencies, by Type of Hospital Control

A breakdown of residencies by type of hospital control is shown in table 8. Federal hospitals numbered 125 in a total of 1,248 and offered 4,614 residencies in a total of 30,595 positions. The Veterans Administration hospitals were responsible for 3,258 residencies, which is 11% of the total number offered. State, county, and city hospitals offered 10,834 positions; the city hospitals being highest in this category with 3,339 positions. Nongovernmental hospitals were responsible for 14,800 residency positions and proprietary hospitals for 250. The figures for the subspecialties of preventive medicine (aviation medicine, occupational medicine, and public health) are quoted in a separate category, since organizations other than hospitals offered training in these specialties.

TABLE 7.—*Number of Residencies, by Specialty, 1957-1958*

		No. of Residencies					
		First Yr. Appointments			Total Appointments (All Yr.)		
Specialty	No. of Approved Programs	Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled	Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled
Allergy	21	17	5	77	26	10	72
Anesthesiology	220	529	122	81	1,022	253	80
Aviation medicine	3	11	...	100	20	...	100
Cardiovascular disease	52	53	4	93	110	19	85
Dermatology	74	118	13	90	278	28	91
Gastroenterology	34	27	5	80	57	17	77
General practice	195	367	174	68	468	279	63
Internal medicine	602	2,219	367	86	4,409	992	81
Neurological surgery	106	71	25	74	324	60	84
Neurology	109	128	51	71	250	118	70
Obstetrics-gynecology	484	942	72	93	2,324	201	92
Occupational medicine	...	...	...	...	...	...	...
Ophthalmology	162	251	25	91	653	62	91
Orthopedic surgery	284	330	52	87	997	170	85
Otolaryngology	129	133	42	75	365	100	78
Pathology	643	709	294	71	1,647	821	67
Pediatrics	251	737	106	87	1,517	236	86
Physical medicine	66	74	47	61	171	115	60
Plastic surgery	41	25	4	86	86	16	84
Proctology	14	9	...	100	23	3	88
Psychiatry	281	1,008	293	78	2,511	797	76
Public health	15	24	31	44	30	47	39
Pulmonary diseases	113	196	69	74	254	105	71
Radiology	361	481	170	74	1,306	438	75
Surgery	686	1,966	213	90	5,364	560	90
Thoracic surgery	96	86	13	87	194	28	87
Urology	227	176	55	76	540	144	79
Totals	5,299	10,687	2,252	83	24,976	5,619	82

The occupancy rate for federal hospitals on Sept. 1, 1957, was 75%. The rate for governmental nonfederal hospitals was 84%, that for nongovernmental hospitals 82%, and the rate for proprietary hospitals 79%. The over-all occupancy rate for all hospitals and other groups offering residency training was 82%, a 1% increase since last year.

Residencies, by Hospital Bed Capacities

Table 9 indicates the number of residencies according to classification by bed capacity. The largest group of hospitals in this classification has more than 500-bed capacity; this group offered 16,460 residencies, or half the residencies available. The highest percentage of positions filled on Sept. 1, 1957, was in the 50-99 classification, with 89% filled; the group of hospitals having more than 500 beds was 88% filled on the same date.

Again, the subspecialties in preventive medicine (aviation medicine, occupational medicine, and public health) are placed in a separate category as training in these specialties is not under hospital control. It is noted that the number of approved hospitals is 1,248 in comparison with 1,199 for the previous year, and the number of approved programs is 5,299, comparing with 5,134 programs last year. The over-all occupancy rate is 82%.

TABLE 8.—*Number of Residencies, by Type of Hospital Control, 1957-1958*

Control	No. of Approved Hospitals	No. of Approved Programs	No. of Residencies: First Yr. Appointments: Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled	Total Appointments (All Yr.): Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled
Federal								
U. S. Air Force	4	11	17	6	74	36	44	45
U. S. Army	12	82	175	61	74	389	227	63
U. S. Navy	8	78	196	...	100	398	...	100
U. S. Public Health Service	9	33	50	4	93	130	28	82
Veterans Administration	89	534	848	383	69	2,403	855	74
Other federal	3	18	34	5	87	96	8	94
Totals	125	756	1,320	459	70	3,452	1,162	75
Governmental (nonfederal)								
State	159	563	1,639	321	83	4,178	836	83
County	66	302	651	169	79	1,507	378	79
City	80	431	1,240	128	91	2,979	360	89
City-county	19	129	226	45	84	470	120	80
Totals	324	1,425	3,756	663	85	9,140	1,694	84
Nongovernmental nonprofit								
Church operated and church related	294	1,056	1,668	394	81	3,013	949	74
Other nonprofit	478	1,994	3,813	682	85	9,123	1,715	83
Totals	772	3,050	5,481	1,076	84	12,136	2,664	82
Proprietary								
Individual	3	5	2	2	50	7	6	54
Partnership	1	4	4	1	20	4	1	20
Corporation	23	41	89	20	82	187	45	81
Subtotals	27	50	95	23	81	198	52	79
Totals	1,248	5,281	10,652	2,221	83	24,926	5,572	82
Other than hospitals								
Aviation medicine	...	3	11	...	100	20	...	100
Occupational medicine	...	...	...	...	...	...	...	...
Public health	...	15	24	31	44	30	47	39
Totals	...	18	35	31	53	50	47	52
Grand totals	1,248	5,299	10,687	2,252	83	24,976	5,619	82

RÉSUMÉ

This 32nd Annual Report contains factual information and statistical data on approved internships and residencies in the United States and its territories and possessions. This information is presented to assist medical students, interns, and residents in choosing programs of medical training at the graduate level where they may continue their medical education. Analysis is made of statistical tables presented, and there are brief write-ups on the National Intern Matching Program and the review committees on internships and residencies. The report is followed by complete lists of hospitals and other institutions offering approved internships and residencies, with detailed information regarding each program.

TABLE 9.—*Number of Residencies, by Bed Capacity, 1957-1958*

Classification	No. of Approved Hospitals	No. of Approved Programs	No. of Residencies: First Yr. Appointments: Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled	Total Appointments (All Yr.): Filled Sept. 1, 1957	Vacant Sept. 1, 1957	Percentage Filled
Less than 50 beds	18	24	18	5	78	42	17	71
50-99	66	72	117	17	87	299	34	89
100-199	209	392	624	156	80	1,323	307	81
200-299	314	1,010	1,399	371	79	3,132	826	79
300-499	327	1,763	2,964	646	82	6,335	1,647	79
Over 500	306	2,004	5,484	1,014	81	13,679	2,701	88
Other	8	16	46	12	83	124	40	76
Totals	1,248	5,281	10,652	2,221	83	24,926	5,572	82
Other than hospitals								
Aviation medicine	...	3	11	...	100	20	...	100
Occupational medicine	...	...	...	...	...	...	...	...
Public health	...	15	24	31	44	30	47	39
Totals	...	18	35	31	53	50	47	52
Grand totals	1,248	5,299	10,687	2,252	83	24,976	5,619	82

The number of approved internships, 12,325, shows a 4% increase over the figure of 11,895 positions offered the previous year. The number of approved residencies also increased 6%, with 30,595 positions offered as compared with 28,528 last year. A total of 6,392 programs was offered this year, compared with 6,235 programs last year. The number of hospitals and other institutions offering graduate training increased from 1,372 to 1,400. Of this number, 141 offered intern training only, 537 gave resident training only, and 722 were approved for both intern and resident training.

The occupancy rate for internships on Sept. 1, 1957, was 83%, the same as for the previous year. The rate for residencies on the same date was 82%, an increase of 1% over last year's figure.

The review committees are functioning effectively for the internship, for 17 specialty fields, and for general practice. There are no review committees for two specialties. Graduate training has been offered in 27 fields.

The Council has presented this report in the hope that it will be helpful to all individuals interested in medical education at the internship and residency levels.

APPROVED INTERNSHIPS

Council on Medical Education and Hospitals of the American Medical Association
535 North Dearborn Street, Chicago 10

Revised to September 1, 1958

HOSPITALS, 853 INTERNSHIPS, 12,626

The following general hospitals, investigated and approved by the Council on Medical Education and Hospitals, are considered in position to furnish acceptable intern training in accordance with standards adopted by the American Medical Association. Three types of internships are approved by the Council—rotating, mixed, and straight:

1. A rotating internship is defined as one that provides supervised experience in internal medicine, surgery, pediatrics, obstetrics, and their related subspecialties, together with experience in laboratory and radiologic diagnosis.
2. A mixed internship is defined as one that provides supervised experience in two or more, but not in all, of the clinical divisions named.
3. A straight internship is defined as one that provides supervised experience in a single department, although it may include limited opportunity for work in a related subspecialty. Straight internships are now approved in internal medicine, surgery, pediatrics, pathology, and obstetrics-gynecology.

Hospitals approved for internships that are used by medical schools for undergraduate clinical clerkships on inpatient services have been identified in the following lists by the symbols X and x. Hospitals have been identified with symbol X when a medical school has indicated that the hospital is a major unit in the school's teaching program. Hospitals have been identified with the symbol x when a medical school has indicated that the hospital is used to a limited extent in the school's teaching program. Certain internships in hospitals designated as teaching hospitals may not provide for assignments to teaching services. Other internships may provide for only a portion of the internship period being spent on teaching services. Prospective interns desiring specific information concerning internship assignments to teaching services in a hospital are advised to communicate with the dean of the medical school with which the hospital is affiliated. Medical school affiliations are indicated by footnotes 10 to 90 placed immediately after the symbol X or x. The list of medical schools appears on page 553. The plus (+) sign indicates additional approval for residencies in specialties, as shown in the Council's list of Approved Residencies and Fellowships. The beginning stipends for Federal hospitals have not been listed; they are established in accordance with government pay tables. When applying for internships in Air Force, Army, Navy, or Public Health Service hospitals, applications should be directed to the medical departments of the Air Force, Army, Navy, or the United States Public Health Service and not to the individual hospitals. Although applications are made to the service rather than to individual hospitals, all of the services ask students to list three hospitals in order of preference. Every possible effort is made to place successful candidates in accordance with their desires. Because of the needs of the service it should be understood that students may, in some instances, be assigned to other hospitals than those for which they have indicated a preference.

Hospitals listed below (pages 529 to 552) make first year internship appointments through the National Intern Matching Program, Inc. The number and type of internships as listed represent appointments for the intern year 1959-1960.

FEDERAL

Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
UNITED STATES ARMY—Hospitals, 10; Internships, 178										
Letterman Army Hospital +1-4-5-x15 Presidio, San Francisco	Fed	1,017	11,507	Req	93	12	No	...		
Fitzsimons Army Hospital +1-4-5 Denver 8	Fed	1,025	9,004	Req	92	12	No	...		
Walter Reed Army Hospital +1-4-5-x19 (Army Medical Center) 6825 16th St, N. W., Washington 12, D C.	Fed	1,250	13,827	Req	88	12	129	...		
U. S. Army Hospital +1-5 Fort Benning, Ga.	Fed	550	11,762	Req	90	12	No	...		
U. S Army Hospital +1-5 Fort Bragg, N. C.	Fed	500	10,402	Req	48	12	No	...		
Valley Forge Army Hospital 1-3-4 Phoenixville, Pa.	Fed	900	6,184	Req	85	12	253	...		
William Beaumont Army Hospital +1-4-5 Hayes Ave, El Paso, Texas	Fed	600	14,376	Req	89	12	No	...	178 Rotating General Office of the Surgeon General, Department of the Army Washington 25, D. C. Attn. Chief Personnel Division	00411
Brooke Army Hospital +1-4-5 Brooke Army Medical Center Fort Sam Houston, San Antonio, Texas	Fed	975	15,190	Req	91	12	No	...		
Madigan Army Hospital +1-4-5-x87 Fort Lewis, Tacoma 9, Wash.	Fed	500	11,477	Req	90	12	No	...		
Tripler Army Hospital +1-4-5 Moanalua Gardens, Honolulu, T. H.	Fed	1,200	20,232	Req	78	12	No	...		
UNITED STATES AIR FORCE—Hospitals, 1: Internships, 84										
U. S. Air Force Hospital +4 Lackland Air Force Base San Antonio, Texas 60 of the above 84 Air Force internships are divided among the Army hospitals listed above	Fed	1,000	18,734	Req	63	12	No	...	84 Rotating General Directorate of Staffing and Education, Office of the Surgeon General, Headquarters, U. S. Air Force, Washington 25, D. C.	00311

Hospitals designated with an asterisk (*) in this listing do not participate in the National Intern Matching Program, sponsored by the American Medical Association, the American Hospital Association, the Association of American Medical Colleges, and other cooperating organizations.
Abbreviations and other references will be found on pages 553 through 555.

FEDERAL—Continued

UNITED STATES NAVY—Hospitals, 14; Internships, 176

Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
U. S. Naval Hospital *1-4-5 8750 Mountain Blvd., Oakland 14, Calif.	Fed	1,325	14,387	Req	87	12	No	...	176 Rotating General Bur. of Medicine and Surgery Navy Department Washington 25, D.C.	00211
U. S. Naval Hospital 1-4 Camp Pendleton, Oceanside, Calif.	Fed	1,109	10,142	Req	86	12	No	...		
U. S. Naval Hospital *1-4 Park Blvd., San Diego 31, Calif.	Fed	2,125	26,339	Req	86	12	No	...		
U. S. Naval Hospital Jacksonville 14, Fla.	Fed	487	7,556	Req	89	12	No	...		
U. S. Naval Hospital 1 Pensacola, Fla.	Fed	462	6,531	Req	65	12	No	...		
U. S. Naval Hospital *1-3-4 Great Lakes, Ill.	Fed	850	10,796	Req	86	12	No	...		
U. S. Naval Hospital *1-3 Rockville Pike Bethesda 14, Md.	Fed	1,041	12,551	Req	90	12	No	...		
U. S. Naval Hospital *1-4-x39-41 Chelsea 50, Mass.	Fed	625	3,170	Req	78	12	No	...		
U. S. Naval Hospital *1-4 Linden Blvd., St. Albans 25, N. Y.	Fed	1,325	10,326	Req	73	12	No	...		
U. S. Naval Hospital *1-3-4 17th and Pattison Ave., Philadelphia 45	Fed	1,030	11,498	Req	69	12	No	...		
U. S. Naval Hospital 1-3 3rd and Cypress Sts., Newport, R. I.	Fed	525	7,114	Req	73	12	No	...		
U. S. Naval Hospital 1-3 Naval Base, Charleston, S. C.	Fed	250	5,182	Req	81	12	No	...		
U. S. Naval Hospital *1-3-4 Portsmouth, Va.	Fed	1,600	21,566	Req	80	12	No	...		
U. S. Naval Hospital 1-3 Naval Base, Bremerton, Wash.	Fed	300	4,727	Req	77	12	No	...		

UNITED STATES PUBLIC HEALTH SERVICE—Hospitals, 7; Internships, 88

Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
U. S. Public Health Service Hospital *1-4-5 15th Ave. and Lake St., San Francisco 18	Fed	440	4,255	Req	77	12	137	...	86 Rotating General 2 Mixed Med. Surg. Public Health Service Hosp., Public Health Service, Department of Health, Education and Welfare Washington 25, D. C. Attn. Chairman Committee on Residents and Interns	00111 00124
U. S. Public Health Service Hospital *1-3-4 210 State St., New Orleans 18	Fed	100	5,523	Req	86	12	157	...		
U. S. Public Health Service Hospital *1-3-4 Wyman Park Dr. and 31st St., Baltimore 11	Fed	366	4,863	Req	86	12	184	...		
U. S. Public Health Service Hospital *1-3-4 77 Warren St., Boston 35	Fed	248	3,110	Req	82	12	171	...		
U. S. Public Health Service Hospital *1-3-4 Bay St. and Vanderbilt Ave. Staten Island 4, N. Y.	Fed	788	8,869	Req	77	12	230	...		
U. S. Public Health Service Hospital *1-4 Hampton Blvd., Norfolk 8, Va.	Fed	246	4,074	Req	69	12	279	...		
U. S. Public Health Service Hospital *1-3-4-x-87 1131 14th Ave., S. Seattle 44	Fed	327	4,133	Req	85	12	284	...		

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE—Hospitals, 2; Internships, 34

Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
Freedmen's Hospital *1-3-4-X21 6th and Bryant Sts., N. W., Washington 25, D. C.	Fed	470	10,324	Req	56	12	No	258PM	22 Rotating General	79811
Saint Elizabeths Hospital *1-3-4-x19-20 2600 Nichols Ave., S. E., Washington 20, D. C.	Fed	7,398	1,615	Req	58	12	128	258	12 Rotating General	80411

VETERANS ADMINISTRATION—Hospitals, 5; Internships, 65

Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
Veterans Administration Hospital *5-X13 Wilshire and Sawtelle Blvds., Los Angeles 25	Fed	2,025	1,203	None	79	12	109	...	24 Rotating General 6 Straight Medicine	06311 06332
Veterans Administration Hospital *1-3-X24 5008 Peachtree Rd., N. E., Atlanta 19, Ga.	Fed	300	3,818	Req	70	12	134	...	7 Straight Medicine	11732
Veterans Administration Hospital *1-X68 921 N. E. 13th St., Oklahoma City 4	Fed	488	5,621	None	78	12	246	...	4 Straight Medicine	58932
Veterans Administration Hospital *1-5-X80 4500 S. Lancaster Rd., Dallas 2, Texas	Fed	410	5,471	Req	79	12	266	...	16 Straight Medicine	55732
Veterans Administration Hospital *3-X83 12th Ave. and E St., Salt Lake City 13	Fed	164	2,395	Req	87	12	274	...	3 Rotating General 5 Straight Medicine	73311 .....

NONFEDERAL

ALABAMA—Hospitals, 8; Internships, 121

Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
Birmingham Baptist Hospitals *1 708 Tuscaloosa Ave., Birmingham 11	Church	340	13,751	Req	34	12	100	200FM	12 Rotating General	90311
Carraway Methodist Hospital *1 2506 10th Ave. N., Birmingham 4	Church	256	13,127	Req	34	12	No	200FM	9 Rotating General	86611
St. Vincent's Hospital 1 2701 9th Ct. S., Birmingham 5	Church	200	8,424	Req	31	12	100	225-250FM	8 Rotating General	85111
University Hospital and Hillman Clinic *1-4-X10 619 S. 19th St., Birmingham 3	State	600	25,604	Req	52	12	101	100FM	36 Rotating General 12 Straight Medicine 6 Straight Pediatrics	00711 00732 00731
Lloyd Noland Hospital *1-3 P. O. Box 538, Fairfield	NPCorp	310	10,344	Req	49	12	No	200FM	14 Rotating General	00811
Holy Name of Jesus Hospital 1-3 Moragne Park, Gadsden	Church	140	6,264	None	44	12	No	200FM	4 Rotating General	00611
Mobile County Hospital *1-3 850 St. Anthony St., Mobile 16	CyCo	263	7,589	Req	50	12	No	200FM	15 Rotating General	87211
Druid City Hospital 1-3 809 Birmingham Rd., Tuscaloosa	CyCo	251	14,016	Req	30	12	No	200FM	5 Rotating General	92011

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Abbreviations and other references will be found on pages 553 through 555.

Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
ARIZONA—Hospitals, 5; Internships, 56										
[illegible] Samaritan Hospital +^{1} [illegible] Phoenix	Church	315	17,069	Req	47	12	136	200PM	15 Rotating General	01111
[illegible] Hospital +$^{1-3}$ [illegible] W. Durango St., Phoenix	County	430	7,942	Req	55	12	No	150FM	12 Rotating General	89811
St. Joseph's Hospital +$^{1-3}$ 350 W. Thomas Rd., Phoenix	Church	325	17,000	Req	57	12	No	150-200FM	12 Rotating General	01211
St. Mary's Hospital +$^{1-3}$ St. Mary's Rd., Tucson	Church	300	15,282	Req	44	12	102	150FM	9 Rotating General	01411
Tucson Medical Center +$^{1-3}$ E. Grant Rd. and Beverly Blvd., Tucson	NPCorp	231	10,889	Req	48	12	102	150FM	8 Rotating General	01511
ARKANSAS—Hospitals, 3; Internships, 52										
Arkansas Baptist Hospital +^{1} 1700 W. 13th St., Little Rock	Church	361	17,182	None	27	12	No	275FM	16 Rotating General	01611
St. Vincent Infirmary +$^{1-3}$ Markham and Hayes Sts., Little Rock	Church	315	14,687	Req	37	12	103	275FM	12 Rotating General	01711
University Hospital +^{1}-X11 4301 W. Markham St., Little Rock	State	269	8,491	Req	46	12	307	150	8 Rotating General 4 Straight Medicine 3 Straight Surgery 3 Straight Pediatrics 2 Straight Pathology 4 Straight (Ob.-Gyn.) General Practice (See Residency Programs in General Practice)	01811 01832 01833 01834 01836 01835
CALIFORNIA—Hospitals, 43; Internships, 806										
General Hospital of Riverside County +^{1}-x12 9851 Magnolia Ave., Arlington	County	380	4,091	Req	41	12	No	214PM	10 Rotating General	85011
Herrick Memorial Hospital +$^{1-3}$ 2001 Dwight Way, Berkeley 4	NPCorp	253	8,160	Req	66	12	No	100FM	6 Rotating General	02011
San Joaquin General Hospital +^{1} French Camp	County	650	7,518	Req	57	12	No	175PM	15 Rotating General	02111
General Hospital of Fresno County +$^{1-4}$ 4475 E. Ventura Ave., Fresno 2	County	693	9,097	Req	41	12	No	250PM	18 Rotating General	02211
Glendale Sanitarium and Hospital +^{1} 1509 E. Wilson Ave., Glendale 6	Church	300	11,210	Req	55	12	No	300PM	9 Rotating General	02311
Loma Linda Sanitarium and Hospital +$^{1-3}$-x12 Loma Linda	Church	168	7,317	None	60	12	No	205PM	10 Rotating General	02411
St. Mary's Long Beach Hospital +$^{1-3}$ 509 E. 10th St., Long Beach 13	Church	272	18,154	Req	44	12	No	125-150FM	6 Rotating General	02611
Seaside Memorial Hospital +$^{1-3}$ 1401 Chestnut Ave., Long Beach 13	NPCorp	370	18,510	Req	30	12	106	110FM	15 Rotating General	02711
California Hospital +^{1} 1414 S. Hope St., Los Angeles 15	Church	314	14,606	Req	44	12	105	200FM	8 Rotating General	02911
Cedars of Lebanon Hospital +$^{1-3}$ 4833 Fountain Ave., Los Angeles 29	NPCorp	478	16,219	Req	54	12	106	110FM	15 Rotating General	03011
Childrens Hospital +^{1}-x14 4614 Sunset Blvd., Los Angeles 27	NPCorp	218	8,427	Req	90	12	No	125PM	2 Straight Pediatrics	03134
Hospital of the Good Samaritan +$^{1-3}$ 1212 Shatto St., Los Angeles 17	Church	491	16,496	Req	38	12	107	200FM	8 Rotating General	03211
Los Angeles County Hospital (Medical Unit) +^{1}-X12-14-x13 1200 N. State St., Los Angeles 33	County	3,132	86,434	Req	38	12	No	160	144 Rotating General 8 Straight Medicine	03311 03332
Presbyterian Hospital-Olmsted Memorial +$^{1-3}$ 1322 N. Vermont Ave., Los Angeles 27	Church	286	11,529	Req	40	12	107	140FM	10 Rotating General	03511
Queen of Angels Hospital +$^{1-3}$ 2301 Bellevue Ave., Los Angeles 26	Church	448	19,228	Req	48	12	No	225FM	16 Rotating General	03611
St. Vincent's Hospital +$^{1-3}$ 2131 W. 3rd St., Los Angeles 57	Church	300	11,061	None	38	12	No	250FM	6 Rotating General	03711
Santa Fe Coast Lines Hospital + 610 S. St. Louis St., Los Angeles 23	NPCorp	196	5,309	Req	76	12	108	175FM	9 Rotating General	03811
University of California Hospital +$^{1-3}$-X13 10833 LeConte Ave., Los Angeles 24	NPCorp	320	7,665	Req	87	12	No	168	10 Straight Medicine 8 Straight Surgery 6 Straight Pediatrics 2 Straight Pathology	94632 95633 95634 95636
White Memorial Hospital +$^{1-3}$-X12 1720 Brooklyn Ave., Los Angeles 33	Church	243	10,341	Req	60	12	No	205PM	16 Rotating General	04011
Highland-Almeda County Hospital +$^{1-3-4}$ 2701 14th Ave., Oakland 6	County	450	14,507	Req	58	12	110	115FM	34 Rotating General	04111
Orange County General Hospital +$^{1-3-4}$ 101 Placentia Ave., Orange	County	576	5,812	Req	61	12	111	300	25 Rotating General	04311
Collis P. and Howard Huntington Memorial Hospital +$^{1-3}$ 100 Congress St., Pasadena 2	NPCorp	320	11,427	Req	51	12	112	250-300FM	9 Rotating General	04411
Sacramento County Hospital +$^{1-5}$ 2315 Stockton Blvd., Sacramento 17	County	717	13,058	Req	61	12	No	150FM	26 Rotating General	04611
San Bernardino County Charity Hospital +-x12 780 E. Gilbert St., San Bernardino	County	424	7,130	Req	60	12	No	130PM	14 Rotating General	04711
Mercy Hospital +$^{1-3}$ Hillcrest Dr., San Diego 3	Church	329	18,034	Req	51	12	No	150FM	12 Rotating General	04811
San Diego County General Hospital +^{1} N. End of Front St., San Diego 3	County	789	8,687	Req	39	12	113	200FM	15 Rotating General	04911
Children's Hospital +$^{1-3}$-x16 3700 California St., San Francisco 18	NPCorp	237	9,351	Req	67	12	No	125FM	6 Rotating General	05011
Franklin Hospital +^{1} 14th and Noe Sts., San Francisco 14	NPCorp	240	6,825	Req	32	12	No	150FM	8 Rotating General	05111
French Hospital +$^{1-3}$ 4131 Geary Blvd., San Francisco 18	NPCorp	196	7,041	Req	43	12	302	125FM	10 Rotating General	05211
Kaiser Foundation Hospital +$^{1-3}$ 2425 Geary Blvd., San Francisco 15	NPCorp	222	9,893	Req	78	12	No	190	16 Rotating General	95911

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Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
CALIFORNIA—Continued										
Mary's Help Hospital +$^{1-3}$ 145 Guerrero St., San Francisco 3	Church	179	7,511	Req	46	12	No	125FM	6 Rotating General	05311
Mount Zion Hospital +$^{1-3}$ 1600 Divisadero St., San Francisco 15	NPCorp	305	11,480	Req	65	12	No	100FM	15 Rotating General	05411
St. Joseph's Hospital +$^{1-3}$ Buena Vista Ave., San Francisco 17	Church	200	7,898	Req	34	12	No	150FM	6 Rotating General	05511
St. Luke's Hospital +$^{1-3}$ 1580 Valencia St., San Francisco 10	Church	225	9,812	Req	45	12	No	300FM	8 Rotating General 2 Straight Pathology	05611 05636
St. Mary's Hospital +$^{1-3}$ 2200 Hayes St., San Francisco 17	NPCorp	371	12,427	Req	61	12	No	100-150FM	15 Rotating General	05711
San Francisco Hospital +$^{1-4-5}$-X15-16 1001 Potrero Ave., San Francisco 10	CyCo	1,132	19,189	Req	45	12	126	150		
Stanford University Service Office of the Dean Stanford University School of Medicine 2398 Sacramento St., San Francisco 15									30 Rotating General	05911
University of California Service Dr. Isidore Edelman San Francisco Hospital									30 Rotating General	05811
Southern Pacific General Hospital +$^{1-3}$ 1400 Fell St., San Francisco 17	NPCorp	450	6,715	Req	74	12	114	125FM	25 Rotating General	06011
Stanford University Hospitals +$^{1-3}$-X15 Clay and Webster Sts., San Francisco 15	NPCorp	351	12,685	Req	70	12	115	75FM	7 Straight Medicine 7 Straight Surgery 1 Straight Pediatrics	06132 06133 06134
University of California Hospitals +$^{1-3}$-X16 (Herbert C. Moffitt Hospital) Parnassus and 1st Aves., San Francisco 22 Dr. J. B. Saunders, Dean University of California School of Medicine, San Francisco 22	State	470	12,207	Req	85	12	115	186FM	20 Rotating General 12 Straight Medicine 12 Straight Surgery 5 Straight Pediatrics 3 Straight Pathology	06211 06232 06233 06234 06236
Santa Clara County Hospital +$^{1-4-5}$ Los Gatos Rd., San Jose 28	County	425	6,184	Req	68	12	116	135FM	16 Rotating General	06311
Santa Barbara Cottage Hospital +$^{1-3}$ 320 W. Pueblo St., Santa Barbara	NPCorp	210	7,465	Req	67	12	138	175-200FM	10 Rotating General	06411
Santa Monica Hospital $^{1-3}$ 1250 16th St., Santa Monica	Church	235	13,458	Req	48	12	117	200FM	8 Rotating General	06611
Harbor General Hospital +$^{1-4}$-X13 1124 W. Carson St., Torrance	County	752	11,971	Req	52	12	No	160	36 Rotating General	06711
COLORADO—Hospitals, 12; Internships, 172										
Glockner-Penrose Hospital +$^{1-3}$ 2200 N. Tejon St., Colorado Springs	Church	175	5,459	Req	85	12	118	150FM	2 Rotating General	06811
General Rose Memorial Hospital +$^{1-3}$ 1050 Clermont St., Denver 20	NPCorp	250	11,722	Req	57	12	120	250FM	9 Rotating General	06911
Mercy Hospital +$^{1-3}$ 1619 Milwaukee St., Denver 6	Church	250	10,688	Req	69	12	No	150FM	9 Rotating General	92211
Porter Sanitarium and Hospital +$^{1-3}$ 2525 S. Downing St., Denver 10	Church	205	8,899	Req	59	12	No	150PM	10 Rotating General	07111
Presbyterian Hospital +$^{1-3}$ 19th Ave. and Gilpin St., Denver 18	Church	198	8,889	Req	79	12	121	150FM	9 Rotating General	07211
St. Anthony Hospital +$^{1-3}$ W. 16th and Quitman Sts., Denver 4	Church	258	13,880	Req	59	12	121	250	9 Rotating General	07311
St. Joseph's Hospital +$^{1-3}$ 1818 Humboldt St., Denver 18	Church	372	16,476	Req	55	12	122	150FM	14 Rotating General	07411
St. Luke's Hospital +^{1} 601 E. 19th Ave., Denver 3	Church	442	18,303	Req	61	12	121	215PM	14 Rotating General	07511
University of Colorado Medical Center Colorado General Hospital +$^{1-3}$-X17 4200 E. 9th Ave., Denver 20	State	284	6,984	Req	89	12	119	105PM	24 Rotating General 18 Community Rot.	07611 07610
Denver General Hospital +$^{1-3-4}$-X17 W. 6th Ave. and Cherokee St., Denver 4	CyCo	444	8,523	Req	54	12	119	105PM	24 Rotating General 18 Community Rot.	07711 07610
Weld County General Hospital +^{1} 1801 16th St., Greeley	County	220	7,615	Req	56	12	No	100FM	4 Rotating General	85311
St. Mary-Corwin Hospital +^{1} 1008 Minnequa, Pueblo, Colo.	Church	450	12,794	Req	31	12	No	210PM	8 Rotating General	07811
CONNECTICUT—Hospitals, 21; Internships, 223										
Bridgeport Hospital +$^{1-3}$ 267 Grant St., Bridgeport 10	NPCorp	388	15,096	Req	42	12	No	190FM	14 Rotating General	07911
St. Vincent's Hospital +$^{1-3}$ 2820 Main St., Bridgeport 6	Church	368	16,433	Req	40	12	No	250	15 Rotating General	08011
Bristol Hospital $^{1-3}$ Newell Rd., Bristol	NPCorp	160	7,313	Req	49	12	No	150FM	5 Rotating General	92311
Danbury Hospital +$^{1-3}$ 95 Locust Ave., Danbury	NPCorp	171	7,065	Req	44	12	No	200FM	7 Rotating General	08111
Griffin Hospital $^{1-3}$ Seymour Ave. and Division St., Derby	NPCorp	159	6,017	Req	45	12	123	200FM	7 Rotating General	97711
Greenwich Hospital +$^{1-3}$ Perryridge Rd., Greenwich	NPCorp	245	8,108	Req	77	12	124	100FM	9 Rotating General	08211
Hartford Hospital +$^{1-3-4}$ 80 Seymour St., Hartford 15	NPCorp	804	20,608	Req	70	24	299	50FM	18 Rotating General	08311
Hartford Municipal Hospital and Health Center +$^{1-3}$ 2 Holcomb St., Hartford 5	City	156	4,345	Req	37	12	No	200FM	9 Rotating General	08411
Mount Sinai Hospital $^{1-3}$ 500 Blue Hills Ave., Hartford 12	NPCorp	115	5,701	Req	53	12	No	200FM	6 Rotating General	85411
St. Francis Hospital +$^{1-3-4}$ 114 Woodland St., Hartford 5	Church	578	20,205	Req	12	12	No	150-225FM	13 Rotating General	08511
Manchester Memorial Hospital $^{1-3}$ 71 Haynes St., Manchester	NPCorp	186	8,507	Req	53	12	125	215-300PM	4 Rotating General	85511
Meriden Hospital +$^{1-3}$ 181 Cook Ave., Meriden	NPCorp	215	8,727	Req	46	12	No	150FM	5 Rotating General	08611

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Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
CONNECTICUT—Continued										
Middlesex Hospital +[1-3] 28 Crescent St., Middletown	NPCorp	168	7,721	None	50	12	No	150FM	6 Rotating General	08711
New Britain General Hospital +[1-3] 92 Grand St., New Britain	NPCorp	288	10,945	Req	63	12	No	183FM	8 Rotating General	08811
Grace-New Haven Community Hosp. +[1-3-4]-X18 789 Howard Ave., New Haven 4	NPCorp	662	21,192	Req	64	12	183	115FM	18 Straight Medicine 15 Straight Surgery 7 Straight Pediatrics 7 Straight Pathology	08932 08933 08934 08936
Hospital of St. Raphael +[3-4] 1450 Chapel St., New Haven 11	Church	370	13,127	Req	36	12	No	125-205FM	15 Rotating General	09011
Lawrence and Memorial Hospitals +[1-3] 365 Montauk Ave., New London	NPCorp	224	10,508	Req	56	12	No	200FM	3 Rotating General	09211
Norwalk Hospital +[1-3] 24 Stevens St., Norwalk	NPCorp	302	12,019	Req	50	12	No	160FM	6 Rotating General	09311
Stamford Hospital +[1-3] 190 W. Broad St, Stamford	NPCorp	295	10,625	Req	64	12	No	100FM	10 Rotating General	09511
St. Mary's Hospital +[1-3-4] 56 Franklin St., Waterbury 6	Church	345	13,277	Req	40	12	No	200FM	7 Rotating General	09611
Waterbury Hospital +[1-4] 64 Robbins St., Waterbury 8	NPCorp	374	15,723	Req	59	12	No	200FM	9 Rotating General	09711
DELAWARE—Hospitals, 3; Internships, 34										
Delaware Hospital +[1-3-4] 501 W. 14th St., Wilmington 1	NPCorp	380	13,742	Req	68	12	No	190-260FM	16 Rotating General	09811
Memorial Hospital +[1-3-4]-x70 1501 N. Van Buren St., Wilmington 6	NPCorp	314	9,906	Req	51	12	No	190FM	12 Rotating General	09911
Wilmington General Hospital +[1-3] Chestnut at Broom St., Wilmington 5	NPCorp	187	7,267	Req	53	12	No	190-260FM	6 Rotating General	10011
DISTRICT OF COLUMBIA—Hospitals, 8; Internships, 168										
District of Columbia General Hospital +[1-3-4]-X19-20-x21 19th and E Sts., S.E., Washington 3, D. C.	City	1,083	23,671	Req	58	12	No	208	52 Rotating General	79011
Doctors Hospital +[1-3] 1815 Eye St., N.W., Washington 6	Corp	235	9,410	Req	69	12	127	150PM	8 Rotating General	79711
Georgetown University Hospital +[1-3]-X19 3800 Reservoir Rd., N.W., Washington 7	Church	393	13,106	Req	75	12	139	150-170PM	8 Straight Medicine 6 Mixed (Med.-Surg.)	80132 80124
George Washington University Hospital +[1-3]-X20 901 23rd St., N.W., Washington 7	NPCorp	407	16,503	Req	68	12	128	125PM	13 Rot. (Med.-Maj.) 11 Rot. (Surg.-Maj.) 2 Rot. (Path.-Maj.)	80212 80213 80285
Providence Hospital +[3-4] 1150 Varnum St., N.E., Washington 17	Church	350	15,738	Req	61	12	No	300	18 Rotating General	80311
Sibley Memorial Hospital +[1-3] 1150 N. Capitol St., Washington 2	Church	254	10,270	None	48	12	127	100FM	10 Rotating General	80511
Washington Hospital Center +[1-3-4] (Central Dispensary and Emergency Hospital and Garfield Memorial Hospital) 1st St. and Michigan Ave., N.W., Washington 11	NPCorp	594	20,183	Req	63	12	127	200FM	30 Rotating General	80011
Washington Sanitarium and Hospital [1-3] 7600 Carroll Ave., Washington 12	Church	260	9,281	Req	47	12	130	225PM	10 Rotating General	25411
FLORIDA—Hospitals, 13; Internships, 216										
Baptist Memorial Hospital +[1-3] 800 Miami Rd., Jacksonville 7	Church	272	11,071	Req	51	12	No	300	12 Rotating General	97011
Duval Medical Center +[1-3] 2000 Jefferson St., Jacksonville 8	County	335	8,371	Req	51	12	No	125FM	18 Rotating General	10111
St. Luke's Hospital +[1] 8th St. and Boulevard, Jacksonville 8	NPCorp	225	10,738	Req	30	12	131	275PM	4 Rotating General	10211
St. Vincent's Hospital +[3] Barrs and St. Johns Ave., Jacksonville 4	Church	296	16,018	Req	49	12	No	300PM	18 Rotating General	10311
Jackson Memorial Hospital +[1-4]-X23 1700 N.W., 10th Ave., Miami 36	County	859	29,645	Req	45	12	132	100FM	70 Rotating General 10 Straight Medicine	10411 10432
Mount Sinai Hospital of Greater Miami +[1-3] 4300 Alton Rd., Miami Beach 40	NPCorp	258	9,810	Req	51	12	132	150FM	18 Rotating General	10511
St. Francis Hospital +[1-3] 250 W. 63rd St., Miami Beach 41	Church	250	8,993	Req	28	12	132	135FM	8 Rotating General	10611
Orange Memorial Hospital +[1] 1416 S. Kuhl Ave., Orlando	NPCorp	400	16,233	None	40	12	No	300	12 Rotating General	10711
Sacred Heart Hospital +[1-3] 1010 N. 12th Ave., Pensacola	Church	145	7,166	Req	47	12	140	200FM	3 Rotating General	10811
Mound Park Hospital +[1] 7th St. and 6th Ave. S., St. Petersburg 5	City	409	14,349	Req	31	12	142	260PM	12 Rotating General	91111
Tampa General Hospital +[1] Davis Islands, Tampa 6	City	300	15,291	Req	44	12	141	200FM	22 Rotating General	10911
Good Samaritan Hospital [1] 1300 N. Dixie Hwy., West Palm Beach	NPCorp	230	8,340	Req	26	12	133	200PM	5 Rotating General	98411
St. Mary's Hospital [1] 900 49th St., West Palm Beach	Church	200	7,383	Req	42	12	No	200PM	4 Rotating General	91411
GEORGIA—Hospitals, 15; Internships, 220										
Athens General Hospital [1] 797 Cobb St., Athens	County	149	5,566	Req	25	12	No	275	6 Rotating General	85611
*St. Mary's Hospital [1] 360 N. Milledge Ave., Athens	Church	100	4,364	Req	43	12	No	200FM	4 Rotating General	......
Crawford W. Long Memorial Hospital +[1-3] 35 Linden Ave., N.E., Atlanta 3	Church	514	21,936	Req	42	12	134	275	18 Rotating General	11111
Georgia Baptist Hospital +[1] 300 Boulevard, N.E., Atlanta 12	Church	475	23,165	Req	53	12	No	280	20 Rotating General	11211

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GEORGIA—Continued										
Grady Memorial Hospital +^{1}-X24 *80 Butler St., S.E., Atlanta 3*	County	678	20,042	Req	45	12	No	75FM	20 Rotating General 16 Straight Medicine 12 Straight Surgery 4 Straight Pediatrics	11311 11332 11333 11334
Piedmont Hospital +$^{1-3}$ 1968 Peachtree Rd., N.W., Atlanta 9	NPCorp	213	10,329	Req	56	12	134	225PM	10 Rotating General	11411
St. Joseph's Infirmary +$^{1-3}$ 265 Ivy St., N.E., Atlanta 3	Church	283	13,343	Req	58	12	No	255PM	12 Rotating General	11511
*Eugene Talmadge Memorial Hospital +^{1}-X25 1120 15th St., Augusta	State	300	2,734	Req	77	12	135	175	4 Straight Medicine	.....
University Hospital +-X25 University Pl., Augusta	City	421	13,499	Req	38	12	No	165PM	18 Rotating General	11611
Medical Center +$^{1-3}$ 700 19th St., Columbus	City	300	10,467	Req	30	12	No	200FM	12 Rotating General	11811
Emory University Hospital +$^{1-3}$-X24 Emory University	NPCorp	311	10,883	Req	60	12	No	225PM	8 Straight Medicine 6 Straight Surgery 2 Straight Pathology	11932 11933 11936
Macon Hospital +^{1} *777 Hemlock St., Macon*	CyCo	415	15,853	Req	20	12	No	200FM	24 Rotating General	12011
Kennestone Hospital $^{1-3}$ 1207 Church St., Marietta	City	151	10,728	Req	40	12	No	175FM	10 Rotating General	98611
Floyd Hospital Turner and McCall Blvd., Rome	County	190	11,237	Req	30	12	No	250FM	4 Rotating General	99211
Memorial Hospital of Chatham County +$^{1-3}$ 63rd St. and Waters Ave., Savannah	Dist	300	6,385	Req	61	12	No	250FM	10 Rotating General	97111
ILLINOIS—Hospitals, 52; Internships, 819										
MacNeal Memorial Hospital +$^{1-3}$ 3249 S. Oak Park Ave., Berwyn	NPCorp	276	10,265	None	45	12	No	100-225FM	12 Rotating General	12111
St. Francis Hospital $^{1-3}$ 12918 S. Gregory St., Blue Island	Church	160	7,298	Req	33	12	No	175FM	6 Rotating General	93211
American Hospital +$^{1-3}$ 850 W. Irving Park Rd., Chicago 13	NPCorp	158	5,470	Req	61	12	No	50FM	5 Rotating General	12311
Augustana Hospital +$^{1-3}$ 411 W. Dickens Ave., Chicago 14	Church	320	9,201	Req	52	12	No	100FM	12 Rotating General	12411
Chicago Wesley Memorial Hospital +$^{1-3}$-X27 250 E. Superior St., Chicago 11	Church	568	16,964	None	67	12	144	100FM	24 Rotating General	16211
Columbus Hospital +^{3} 2520 N. Lakeview Ave., Chicago 14	Church	339	11,490	Req	36	12	145	75FM	20 Rotating General	12611
Cook County Hospital +$^{1-3}$-X26-27-28-30 1825 W. Harrison St., Chicago 12	County	3,200	79,223	Req	33	12	No	110FM	138 Rotating General	12711
Edgewater Hospital +$^{1-3}$ 5700 N. Ashland Ave., Chicago 26	NPCorp	290	11,788	Req	34	12	No	100FM	16 Rotating General	12811
Englewood Hospital +^{3} 6001 S. Green St., Chicago 21	NPCorp	151	6,629	None	44	12	No	150FM	6 Rotating General	12911
Evangelical Hospital $^{1-3}$ 5421 S. Morgan St., Chicago 9	Church	195	8,251	Req	29	12	No	150FM	7 Rotating General	13011
Grant Hospital +$^{1-3}$ 551 W. Grant Pl., Chicago 14	NPCorp	258	8,820	Req	47	12	144	200FM	9 Rotating General	13211
Hospital of St. Anthony De Padua +$^{1-3}$ 2875 W. 19th St., Chicago 23	Church	217	7,910	Req	36	12	No	200FM	8 Rotating General	13511
Illinois Central Hospital +$^{1-3}$-X30 5800 Stony Island Ave., Chicago 37	NPCorp	306	7,683	Req	56	12	148	211FM	14 Rotating General	13611
Illinois Masonic Hospital +$^{1-3}$ 836 Wellington Ave., Chicago 14	NPCorp	360	12,930	Req	48	12	No	100FM	12 Rotating General	13711
Jackson Park Hospital $^{1-3}$ 7531 Stony Island Ave., Chicago 49	Corp	146	4,113	None	34	12	No	150FM	8 Rotating General	13811
Loretto Hospital +$^{1-3}$-X28 645 S. Central Ave., Chicago 44	Church	150	5,332	Req	57	12	No	150FM	7 Rotating General	13911
Lutheran Deaconess Home and Hospital +^{3} 1138 N. Leavitt St., Chicago 22	Church	186	6,533	Req	35	12	No	150FM	6 Rotating General	14011
Mercy Hospital +^{1}-X28 2537 S. Prairie Ave., Chicago 16	Church	356	8,932	Req	52	12	No	200FM	15 Rotating General	14111
Michael Reese Hospital +$^{1-3}$-X26-27 2839 S. Ellis Ave., Chicago 16	NPCorp	841	20,720	Req	62	12	No	100FM	41 Rotating General 2 Straight Medicine 1 Straight Surgery 1 Straight Pediatrics 1 Straight Pathology	14211 14232 14233 14234 14236
Mount Sinai Hospital +$^{1-3}$-X26 2750 W. 15[illegible]	NPCorp	373	12,223	Req	41	12	No	125-175	14 Rotating General	14411
Norwegian A[illegible] 1011 N. Fr[illegible]	NPCorp	171	6,856	Req	36	12	No	200FM	10 Rotating General	14511
Passavant M[illegible] +[illegible]-X27 303 E. Superior St., Chicago 11	NPCorp	262	8,277	None	76	12	144	100FM	18 Rotating General	14611
Presbyterian-St. Luke's Hospital +^{1}-X30 (Presbyterian Hospital Division) 1753 W. Congress St., Chicago 12	Church	426	12,290	Req	71	12	No	100FM	24 Rotating General	14711
Presbyterian-St. Luke's Hospital +$^{1-3}$-X30 (St. Luke's Hospital Division) 1439 S. Michigan Ave., Chicago 5	NPCorp	540	13,955	Req	75	12	No	100FM	32 Rotating General	15611
Provident Hospital +$^{1-3}$ 426 E. 51st St., Chicago 15	NPCorp	205	7,168	Req	42	12	No	175FM	9 Rotating General 1 Straight Surgery	14811 14833
Ravenswood Hospital +$^{1-3}$ 1931 W. Wilson Ave., Chicago 40	NPCorp	213	8,306	None	68	12	No	100FM	8 Rotating General	14911
Resurrection Hospital ^{3} 7435 W. Talcott Ave., Chicago 31	Church	188	8,804	Req	65	12	No	250FM	9 Rotating General	93711
St. Anne's Hospital +$^{1-3}$ 4950 W. Thomas St., Chicago 51	Church	322	12,975	Req	44	12	149	200FM	12 Rotating General	15211
St. Bernard's Hospital $^{1-3}$ 6337 S. Harvard Ave., Chicago 21	Church	181	6,044	Req	32	12	No	165FM	8 Rotating General	15311
St. Elizabeth Hospital +^{3} 1431 N. Claremont Ave., Chicago 22	Church	273	10,355	None	38	12	No	200FM	10 Rotating General	15411

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Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
ILLINOIS—Continued										
St. Joseph Hospital +1-2-x28 2100 N. Burling St., Chicago 14	Church	197	6,582	Req	61	12	No	200FM	8 Rotating General	15511
St. Mary of Nazareth Hospital +1-2 1120 N. Leavitt St., Chicago 22	Church	270	8,762	Req	40	12	No	200FM	10 Rotating General	15711
South Chicago Community Hospital 2 2320 E. 93rd St., Chicago 17	NPCorp	250	10,577	Req	24	12	No	150-200FM	10 Rotating General	15811
South Shore Hospital +1-3 8015 S. Luella Ave., Chicago 17	NPCorp	175	7,121	Req	33	12	No	150FM	7 Rotating General	92511
Swedish Covenant Hospital +1-2 5145 N. California Ave., Chicago 25	Church	225	6,531	Req	40	12	No	200-230PM	8 Rotating General	15911
University of Chicago Clinics +1-2-4-X29 950 E. 59th St., Chicago 37	NPCorp	700	16,741	Req	80	12	No	150PM	36 Rotating General 1 Straight Pediatrics	16011 16034
University of Illinois Research and Educational Hospitals +1-4-X30 840 S. Wood St., Chicago 12	State	617	10,923	Req	83	12	No	65FM	36 Rotating General	15011
Woodlawn Hospital +1-2 6060 Drexel Ave., Chicago 37	NPCorp	150	4,392	Req	67	12	No	150PM	6 Rotating General	16411
Decatur and Macon County Hospital + 2300 N. Edward St., Decatur	NPCorp	330	13,126	Req	39	12	No	225FM	8 Rotating General	85711
St. Mary's Hospital 1-2 129 E. 8th St., East St. Louis	Church	320	11,924	Req	25	12	No	150FM	12 Rotating General	16511
Memorial Hospital of Du Page County 1-2 189 Avon Rd., Elmhurst	NPCorp	195	10,451	Req	40	12	No	200FM	9 Rotating General	16611
Evanston Hospital +1-2-X27 2650 Ridge Ave., Evanston	NPCorp	321	11,628	None	80	12	144	200PM	20 Rotating General	16711
St. Francis Hospital +1 355 Ridge Ave., Evanston	Church	296	15,059	Req	62	12	No	200FM	12 Rotating General	16511
Little Company of Mary Hospital +1-2 2800 W. 95th St., Evergreen Park 42	Church	463	19,237	Req	41	12	No	150FM	24 Rotating General	16911
Hinsdale Sanitarium and Hospital 1-2 120 N. Oak St., Hinsdale	Church	193	6,926	Req	43	12	No	200PM	6 Rotating General	93311
Oak Park Hospital 1-2 525 Wisconsin Ave., Oak Park	Church	212	9,223	Req	53	12	No	200-250FM	12 Rotating General	17211
West Suburban Hospital +2 518 N. Austin Blvd., Oak Park	NPCorp	329	12,719	Req	49	12	No	200FM	12 Rotating General	17311
Methodist Hospital of Central Illinois +2 221 N. Glen Oak Ave., Peoria	Church	347	13,205	Req	49	12	No	125FM	16 Rotating General	17411
St. Francis Hospital +1 530 N. Glen Oak Ave., Peoria	Church	614	20,240	Req	62	12	No	200FM	18 Rotating General	17511
Rockford Memorial Hospital +1-2 2400 N. Rockton Ave., Rockford	NPCorp	240	10,458	Req	74	12	No	150FM	8 Rotating General	17711
St. Anthony Hospital +1-3 1401 E. State St., Rockford	Church	221	9,078	None	48	12	No	150FM	6 Rotating General	17811
Swedish-American Hospital 1 1316 Charles St., Rockford	NPCorp	200	9,540	Req	52	12	No	150FM	8 Rotating General	17911
INDIANA—Hospitals, 14; Internships, 189										
St. Catherine Hospital 1-2 4321 Fir St., East Chicago	Church	319	12,149	None	47	12	No	250FM	7 Rotating General	18111
St. Mary's Hospital 1 3700 Washington Ave., Evansville 15	Church	310	11,842	Req	43	12	No	250FM	8 Rotating General	94111
Lutheran Hospital 2 3024 Fairfield Ave., Fort Wayne 6	Church	338	9,163	Req	24	12	No	250FM	6 Rotating General	18311
St. Joseph's Hospital +1-2 730 W. Berry St., Fort Wayne 2	Church	262	9,544	Req	34	12	No	200-250FM	6 Rotating General	90411
Methodist Hospital +1-2 1600 W. 6th Ave., Gary	Church	242	13,120	None	46	12	No	250FM	16 Rotating General	86011
St. Mary Mercy Hospital 1-2 540 Tyler St., Gary	Church	282	12,814	Req	44	12	No	250FM	8 Rotating General	18411
St. Margaret Hospital 25 Douglas St., Hammond	Church	375	14,975	None	30	12	No	300FM	12 Rotating General	18511
Indianapolis General Hospital +1-2-4-X31 960 Locke St., Indianapolis 7	CyCo	640	12,192	Req	50	12	No	200PM	42 Rotating General	18611
Indiana University Medical Center +1-4 1100 W. Michigan St., Indianapolis 7	State	535	11,978	None	69	12	159	115PM	26 Rotating General 4 Straight Surgery	18711 18733
Methodist Hospital +1 1604 N. Capitol Ave., Indianapolis 7	Church	671	27,835	Req	41	12	No	215PM	20 Rotating General	18811
St. Vincent's Hospital +1-2 120 W. Fall Creek Pkwy., Indianapolis 7	Church	300	12,410	Req	41	12	No	210PM	10 Rotating General	18911
Ball Memorial Hospital +1 2401 University Ave., Muncie	NPCorp	300	11,657	Req	43	12	No	250PM	8 Rotating General	19211
Memorial Hospital +1 604 N. Main St., South Bend 1	NPCorp	225	9,821	Req	44	12	No	250FM	8 Rotating General	19311
St. Joseph's Hospital 1-2 401 N. Notre Dame Ave., South Bend 22	Church	183	7,413	Req	38	12	150	250FM	8 Rotating General	19411
IOWA—Hospitals, 8; Internships, 87										
Mercy Hospital 1-2 835 6th Ave. S.E., Cedar Rapids	Church	222	9,048	Req	50	12	No	250FM	8 Rotating General	19611
St. Luke's Methodist Hospital +1-2 1026 A Ave., N.E., Cedar Rapids	Church	316	12,917	Req	52	12	No	250FM	12 Rotating General	19711
Mercy Hospital [illegible] 420 E. [illegible]	Church	171	6,269	Req	30	12	No	300FM	3 Rotating General	19811
Broadlawn [illegible] 18th and Hickman Rd., Des Moines 14	County	237	5,400	Req	57	12	No	200FM	12 Rotating General	19911
Iowa Lutheran Hospital 1-2 716 Parnell Ave., Des Moines 16	Church	205	8,574	Req	31	12	151	175FM	10 Rotating General	20011
Iowa Methodist Hospital +1-2 1200 Pleasant St., Des Moines 14	Church	395	16,371	Req	58	12	No	200FM	10 Rotating General	20111
Mercy Hospital +1-2 4th and Ascension Sts., Des Moines 14	Church	200	11,375	Req	61	12	152	225FM	12 Rotating General	20211
State University of Iowa Hospitals +1-4-X32 Newton Rd., Iowa City	State	902	21,761	Req	72	12	No	155FM	20 Rotating General	20311

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KANSAS—Hospitals, 6; Internships, 93										
Bethany Hospital $^{1-3}$ 51 N. 12th St., Kansas City 7	Church	159	6,878	None	37	12	153	300PM	8 Rotating General	20511
St. Margaret's Hospital $^{+1}$ 8th St. and Vermont Ave., Kansas City 8	Church	215	7,876	Req	46	12	No	225FM	6 Rotating General	20711
University of Kansas Medical Center $^{+1-3-4}$-X33 39th and Rainbow Blvd., Kansas City 3	State	534	13,536	None	71	12	160	40PM	12 Rotating General 1 Straight Medicine 1 Straight Surgery 3 Straight Pediatrics 1 Straight Pathology 5 Mixed (Med.-Surg.-Ped.) 1 (Mixed Path.-Med.) 1 Mixed Path.-Surg.)	20611 20632 20633 20634 20636 20623 20627 20656
St. Francis Hospital $^{+1-3}$ 928 N. Emporia Ave., Wichita 5	Church	505	20,459	None	43	12	300	225FM	24 Rotating General	20911
Wesley Hospital $^{+1-3}$ 550 N. Hillside Ave., Wichita 6	Church	457	18,836	Req	42	12	154	300FM	18 Rotating General	21011
Wichita-St. Joseph Hospital $^{+1-3}$ 3400 E. Grand Ave., Wichita 17	Church	375	15,230	Req	35	12	155	150FM	12 Rotating General	21111
KENTUCKY—Hospitals, 7; Internships, 98										
St. Elizabeth Hospital $^{+1-3}$ 21st and Eastern Ave., Covington	Church	365	12,993	Req	34	12	No	200FM	12 Rotating General	21211
Good Samaritan Hospital $^{+1-3}$ 310 S. Limestone St., Lexington	Church	270	10,039	Req	42	12	No	150FM	11 Rotating General	21411
St. Joseph Hospital $^{+1-3}$ 544 W. 2nd St., Lexington	Church	243	9,184	Req	31	12	No	200FM	8 Rotating General	21511
Louisville General Hospital $^{+1-3-4}$-X34 323 E. Chestnut St., Louisville 2	CyCo	386	10,800	Req	48	12	218	70FM	22 Rotating General 8 Straight Medicine 10 Straight Pediatrics	21711 21732 21734
St. Anthony Hospital $^{+1-3}$ 1313 St. Anthony Pl., Louisville 4	Church	235	10,772	None	20	12	No	200FM	5 Rotating General	21911
St. Joseph Infirmary $^{+1}$ 735 Eastern Pkwy., Louisville 17	Church	440	20,054	Req	37	12	No	200FM	18 Rotating General	22011
SS. Mary and Elizabeth Hospital ^{3} 1367 S. 12th St., Louisville 10	Church	177	9,895	Req	33	12	156	200FM	4 Rotating General	22111
LOUISIANA—Hospitals, 9; Internships, 241										
Charity Hospital of Louisiana $^{+1-3-4}$-X35-36 1532 Tulane Ave., New Orleans 12	State	2,893	62,256	Req	68	12	No	75FM	130 Rotating General	22411
Hotel Dieu $^{+1-3}$ 2004 Tulane Ave., New Orleans 16	Church	291	13,571	Req	25	12	No	150FM	12 Rotating General	22511
Mercy Hospital ^{3} 301 N. Jefferson Davis Pkwy., New Orleans 19	Church	191	10,956	Req	34	12	No	175FM	9 Rotating General	22611
Ochsner Foundation Hospital $^{+1-3}$ 1516 Jefferson Hwy., New Orleans 21	NPCorp	253	8,231	None	78	12	No	125FM	4 Straight Medicine	96632
Southern Baptist Hospital $^{+1-3}$ 2700 Napoleon Ave., New Orleans 15	Church	436	19,757	Req	39	12	No	175PM	20 Rotating General	22811
Touro Infirmary $^{+1-3}$-x36 3516 Prytania St., New Orleans 15	NPCorp	457	21,956	Req	52	12	No	100FM	20 Rotating General	22911
Confederate Memorial Medical Center $^{+1-4}$ 1541 Kings Hwy., Shreveport	State	948	23,158	Req	33	12	No	100FM	36 Rotating General	23211
North Louisiana [illegible] 1 1130 Louisian[illegible]	Corp	120	4,893	Req	46	12	158	250FM	3 Rotating General	23011
T. E. Schumpert [illegible] $^{1-3}$ 911 Margaret Pl., Shreveport 16	Church	107	7,187	Req	37	12	No	250PM	7 Rotating General	23111
MAINE—Hospitals, 4; Internships, 28										
Eastern Maine General Hospital $^{+1}$ 489 State St., Bangor	NPCorp	297	9,836	Req	46	12	No	100FM	8 Rotating General	23311
*Central Maine General Hospital $^{+1-3}$ 300 Main St., Lewiston	NPCorp	220	7,291	Req	51	12	No	190FM	4 Rotating General	.....
St. Mary's General Hospital $^{1-3}$ 318 Sabattus St., Lewiston	Church	150	4,935	Req	24	12	No	120FM	4 Rotating General	23511
Maine Medical Center $^{+1-5}$ 22 Bramhall St., Portland 4	NPCorp	400	12,347	Req	37	12	No	100FM	12 Rotating General	23611
MARYLAND—Hospitals, 19; Internships, 305										
Baltimore City Hospitals $^{+1-3-4}$-x37-X38 4940 Eastern Ave., Baltimore 24	City	1,140	12,999	Req	66	12	217	50FM	12 Rotating General 9 Straight Medicine 6 Straight Surgery 3 Straight Pediatrics 1 Straight Pathology 2 Mixed (Med.-Ped.) 2 Mixed (Ped.-Med.)	23711 23732 23733 23734 23736 23753 23754
Bon Secours Hospital $^{+3}$ 2025 W. Fayette St., Baltimore 23	Church	169	7,635	Req	39	12	No	225FM	6 Rotating General	23811
Church Home and Hospital $^{+1-3}$ Broadway and Fairmount Aves., Baltimore 31	Church	183	6,084	Req	67	12	161	175FM	8 Rotating General 1 Straight Medicine	23911 23932
Franklin Square Hospital $^{+1-3}$ 110 N. Calhoun St., Baltimore 23	NPCorp	174	6,768	Req	71	12	162	200FM	12 Rotating General	24011
Hospital for Women $^{+1-3}$ Lafayette Ave. and John St., Baltimore 17	NPCorp	153	7,339	Req	48	12	185	200FM	5 Mixed (Med.-Ob.-Gyn.)	24109
Johns Hopkins Hospital $^{+1-3-4}$-X37 601 N. Broadway, Baltimore 5	NPCorp	991	23,799	Req	70	12	185	25FM	15 Straight Medicine 11 Straight Medicine (Private Wards) 7 Straight Ob.-Gyn. 19 Straight Surgery 12 Straight Pediatrics 3 Straight Pathology	24232 24238 24235 24233 24234 24236

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MARYLAND—Continued										
Lutheran Hospital +1-2-4 730 Ashburton St., Baltimore 16	Church	191	7,557	Req	46	12	184	200FM	10 Rotating General	24311
Maryland General Hospital +1-2-x38 Linden Ave. and Madison St., Baltimore 1	Church	357	8,747	Req	54	12	No	200FM	14 Rotating General	24411
Mercy Hospital +1-2-4-x38 Calvert and Saratoga Sts., Baltimore 2	Church	300	12,007	Req	40	12	No	225PM	16 Rotating General	24511
Provident Hospital and Free Dispensary +1-2-4 1514 Division St., Baltimore 17	NPCorp	137	4,903	Req	38	12	No	175FM	9 Rotating General	24611
St. Agnes Hospital +1-2 1000 Caton Ave., Baltimore 29	Church	217	8,612	Req	45	12	184	250PM	9 Rotating General	24711
St. Joseph's Hospital +2 1400 N. Caroline St., Baltimore 13	Church	241	8,020	Req	45	12	184	200FM	8 Rotating General	24811
Sinai Hospital +1-2-4 1714 E. Monument St., Baltimore 5	NPCorp	308	12,987	Req	45	12	No	100FM	2 Rotating General 5 Rot. (Med. Major) 1 Rot. (Ped. Major) 4 Rot. (Surg. Major) 4 Straight Medicine 1 Straight Pediatrics 2 Straight Surgery	24911 24912 24914 24913 24932 24934 24933
South Baltimore General Hospital +1-2 1213 Light St., Baltimore 30	NPCorp	184	6,315	Req	43	12	No	140FM	8 Rotating General	25011
Union Memorial Hospital +1-2 33rd and Calvert Sts., Baltimore 18	NPCorp	361	10,763	Req	42	12	No	200FM	16 Rotating General	25111
University Hospital +1-2-4 X38 Redwood and Greene Sts., Baltimore 1	State	604	13,376	Req	49	12	No	50FM	16 Rotating General 5 Straight Medicine 3 Straight Pediatrics 2 Straight Surgery 4 Mixed (Surg.-Ob.-Gyn.)	25211 25232 25234 25233 25226
Suburban Hospital +1-2 8600 Old Georgetown Rd., Bethesda 14	NPCorp	170	7,745	Req	53	12	No	100-150FM	10 Rotating General	25311
Prince George's General Hospital +1-2 Cheverly	County	235	11,448	Req	39	12	No	150FM	14 Rotating General	90511
Washington County Hospital +1 King and Antietam Sts., Hagerstown	NPCorp	295	11,297	Req	32	12	No	200FM	8 Rotating General	94511
MASSACHUSETTS—Hospitals, 35; Internships, 396										
Beverly Hospital +1-2 Heather and Herrick Sts., Beverly	NPCorp	227	6,591	Req	63	12	No	100	6 Rotating General	25511
Beth Israel Hospital +1-2-4-X40-41 330 Brookline Ave., Boston 15	NPCorp	330	11,887	Req	49	12	163	150	10 Straight Medicine 5 Straight Surgery	25632 25633
Boston City Hospital +1-2-4-X39-40-41 818 Harrison Ave., Boston 18 Chrm. Com. Internship Exams	City	1,570	30,465	Req	53	12	No	112FM		
	I and III	Medical Tufts							16 Straight Medicine	25793
	II and IV	Medical Harvard							16 Straight Medicine	25794
	V and VI	Medical Boston Univ.							16 Straight Medicine	25795
	I	Surgical Tufts							8 Straight Surgery	25796
	III	Surgical Boston Univ.							8 Straight Surgery	25798
	V	Surgical Harvard							6 Straight Surgery	25703
		Straight Specialties, Boston Univ.							6 Straight Pediatrics	25704
		Pathology							5 Straight Pathology	25736
Boston Floating Hospital +1-2-X41 20 Ash St., Boston 11	NPCorp	75	2,002	Req	81	12	164	83FM	4 Straight Pediatrics	98734
Carney Hospital + 2100 Dorchester Ave., Boston 24	Church	316	10,613	Req	36	12	164	125FM	12 Rotating General	25811
Children's Medical Center +1-2-4-X40 300 Longwood Ave., Boston 15	NPCorp	304	8,780	Req	84	12	165	FM	5 Straight Pediatrics 2 Straight Pathology	25934 25936
Massachusetts General Hospital +1-2-4-X40 Fruit St., Boston 14	NPCorp	906	23,628	Req	80	12	166	25-54FM	12 Straight Medicine 8 Straight Surgery 7 Straight Pediatrics 2 Straight Pathology	26132 26133 26134 26136
Massachusetts Memorial Hospitals +1-2-X39 750 Harrison Ave., Boston 18	NPCorp	316	6,936	Req	57	12	167	150PM	10 Straight Medicine 6 Straight Surgery 1 Straight Pathology	26232 26233 26236
New England Center Hospital +1-2-X41 Harrison Avenue and Bennet St., Boston 11	NPCorp	208	6,202	Req	59	12	168	83FM	12 Straight Medicine 6 Straight Surgery	26332 26333
New England Hospital +1-2 Columbus Ave. and Dimock St., Boston 19	NPCorp	150	4,434	Req	50	12	169	60FM	6 Rotating General	26411
Peter Bent Brigham Hospital +1-2-4-X40 721 Huntington Ave., Boston 15	NPCorp	280	6,112	Req	77	12	170	25FM	13 Straight Medicine 6 Straight Surgery	26532 26533
St. Elizabeth's Hospital +1-2-X41 736 Cambridge St., Boston 35	Church	400	13,717	Req	50	12	No	110FM	14 Rotating General	26611
Brockton Hospital +1-2 680 Centre St., Brockton 11	NPCorp	218	8,005	Req	40	12	No	250FM	4 Rotating General	26711
Cambridge City Hospital +1-2x41 1493 Cambridge St., Cambridge 39	City	246	6,624	Req	38	12	No	140FM	12 Rotating General	26811
Mount Auburn Hospital +1-2-x40 330 Mt. Auburn St., Cambridge 38	NPCorp	248	8,131	Req	86	12	172	100FM	6 Rotating General	26911
Truesdale Hospital +1-2 1820 Highland Ave., Fall River	NPCorp	152	4,658	Req	37	12	173	100FM	7 Rotating General	27011
Union Hospital 1-2 300 Hanover St., Fall River	NPCorp	183	5,203	Req	37	12	No	100-150FM	10 Rotating General	86411
Holyoke Hospital +1-2-4 575 Beech St., Holyoke	NPCorp	197	7,044	Req	39	12	No	100FM	2 Rotating General 2 Mixed (Med.-Surg.)	27311 27324
Lawrence General Hospital +1-2 1 Garden St., Lawrence	NPCorp	188	7,247	Req	39	12	No	100FM	4 Rotating General	27411
Lowell General Hospital +1-2 295 Varnum Ave., Lowell	NPCorp	215	6,757	Req	38	12	No	100-150FM	2 Rotating General	27511
St. John's Hospital 2 14 Bartlett St., Lowell	Church	183	7,491	Req	38	12	No	150FM	4 Rotating General	27611
St. Joseph's Hospital 2 830 Merrimack St., Lowell	Church	190	7,408	Req	25	12	No	125FM	4 Rotating General	27711

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Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
MASSACHUSETTS—Continued										
Lynn Hospital +1-3 212 Boston St., Lynn	NPCorp	281	9,763	Req	39	12	No	100FM	10 Rotating General	27811
St. Luke's Hospital +1-3 101 Page St., New Bedford	NPCorp	355	11,973	Req	33	12	No	150FM	10 Rotating General	27911
Newton-Wellesley Hospital +1-3 2014 Washington St., Newton Lower Falls 62	NPCorp	235	8,037	Req	51	12	No	165FM	6 Rotating General	28011
St. Luke's Hospital 1-3 379 East St., Pittsfield	Church	150	4,849	Req	37	12	No	150FM	3 Rotating General	28211
Quincy City Hospital +1-3-4 114 Whitwell St., Quincy 69	City	247	9,787	Req	57	12	No	151FM	12 Rotating General	28311
Salem Hospital +1-3-4 81 Highland Ave., Salem	NPCorp	243	8,401	Req	35	12	174	150-190FM	6 Rotating General	28411
Mercy Hospital 1-3 233 Carew St., Springfield 4	Church	340	12,079	Req	27	12	No	200FM	6 Rotating General	28511
Springfield Hospital +1-3 759 Chestnut St., Springfield 7	NPCorp	331	11,368	Req	50	12	175	75FM	8 Rotating General	28611
Wesson Memorial Hospital 1-3 140 High St., Springfield 5	NPCorp	193	7,827	None	36	12	175	100FM	4 Rotating General	28711
Waltham Hospital 1-x41 Hope Ave., Waltham 54	NPCorp	140	5,740	Req	34	12	No	200FM	4 Rotating General	28811
Memorial Hospital +1-3-4 119 Belmont St., Worcester 5	NPCorp	288	10,082	Req	61	12	No	150-190FM	9 Rotating General	28911
St. Vincent Hospital +1-3 25 Winthrop St., Worcester 10	Church	554	15,236	Req	46	12	No	150-200FM	15 Rotating General	29011
Worcester City Hospital +1-3-4 71 Jaques Ave., Worcester 9	City	448	10,628	None	51	12	No	119FM	18 Rotating General	29111
MICHIGAN—Hospitals, 38; Internships, 644										
St. Joseph Mercy Hospital +1-3 326 N. Ingalls St., Ann Arbor	Church	385	14,078	Req	56	12	No	285FM	16 Rotating General	29211
University Hospital +1-3-4-X42 1313 E. Ann St., Ann Arbor	State	1,039	19,990	None	74	12	176	130	3 Rot. (Anes. Major) 2 Rot. (Derm. Major) 12 Rot. (Gen. Prac. Maj.) 8 Rot. (Med. Major) 2 Rot. (Neuro. Major) 3 Rot. (Ob.-Gyn. Major) 1 Rot. (Ophth. Major) 1 Rot. (Otol. Major) 2 Rot. (Path. Major) 3 Rot. (Ped. Major) 2 Rot. (Phys. Med. & Rehab. Major) 14 Rot. (Surg. Major)	29377 29375 29359 29312 29374 29315 29379 29378 29386 29314 29380 29313
Leila Y. Post Montgomery Hospital +1-3 9 Emmett St., Battle Creek	Church	189	7,995	Req	30	12	No	275FM	4 Rotating General	29411
Mercy Hospital 1 9[illegible]0 Avard St., Benton Harbor	NPCorp	154	6,621	Req	56	12	No	225FM	6 Rotating General	96011
Oakwood Hospital +1-3 18101 Oakwood Blvd., Dearborn 8	NPCorp	234	12,078	Req	57	12	177	200-250FM	10 Rotating General	94611
Detroit Memorial Hospital +1-3-x43 1420 St. Antoine St., Detroit 26	NPCorp	322	11,752	Req	52	12	178	400PM	12 Rotating General	29611
Evangelical Deaconess Hospital +1-3 3245 E. Jefferson Ave., Detroit 7	Church	185	7,724	Req	46	12	179	250PM	8 Rotating General	29711
Grace Hospital +1-3-X43 4160 John R. St., Detroit 1	NPCorp	744	28,350	Req	47	12	180	250PM	24 Rotating General	29811
Harper Hospital +1-3-X43 3825 Brush St., Detroit 1	NPCorp	643	22,981	Req	51	12	180	250PM	36 Rotating General	29911
Henry Ford Hospital +1-3 2799 W. Grand Blvd., Detroit 2	NPCorp	830	21,225	None	71	12	No	225	24 Rotating General 10 Rot. (Med. Major) 10 Rot. (Surg. Major)	30011 30012 30013
Mount Carmel Mercy Hospital +1-3-4 6071 W. Outer Dr., Detroit 35	Church	567	24,442	Req	55	12	303	250FM	24 Rotating General	30211
Providence [illegible] +1-3 2500 W [illegible] 8	Church	396	14,891	Req	55	12	181	250PM	12 Rotating General	30311
Receiving [illegible] X[illegible] 1326 St. Antoine St., Detroit [illegible]6	City	700	22,827	Req	53	12	182	254FM	59 Rotating General	29511
St. John Hospital +1-3 22101 Moross Rd., Detroit 36	NPCorp	292	12,598	Req	57	12	No	300PM	12 Rotating General	91511
St. Joseph Mercy Hospital +1 2200 E. Grand Blvd., Detroit 11	Church	225	8,996	Req	46	12	190	300FM	7 Rotating General	30411
Sinai Hospital +1-4 6767 W. Outer Dr., Detroit 35	NPCorp	231	10,125	Req	55	12	180	225PM	15 Rotating General	92011
Woman's Hospital +1 432 E. Hancock Ave., Detroit 1	NPCorp	381	12,946	Req	32	12	180	450	16 Rotating General	30511
Wayne County General Hospital and Infirmary +1-3 Eloise	County	4,003	8,483	Req	32	12	191	286FM	36 Rotating General	30611
Hurley Hospital +1-3 6th Ave. and Begole St., Flint 2	City	647	20,504	None	56	12	No	250PM	36 Rotating General	30711
McLaren General Hospital +1 401 Ballenger Hwy., Flint 3	NPCorp	284	12,255	Req	53	12	No	300PM	12 Rotating General	80611
St. Joseph Hospital +1-3 302 Kensington Ave., Flint 2	Church	300	15,850	Req	61	12	192	300PM	18 Rotating General	30811
Blodgett Memorial Hospital +1-3 1840 Wealthy St., S.E., Grand Rapids 6	NPCorp	320	12,910	Req	80	12	193	250FM	16 Rotating General	30911
Butterworth Hospital +1-3 300 Bostwick Ave., N.E., Grand Rapids 3	NPCorp	416	16,792	Req	61	12	No	250FM	16 Rotating General	31011
St. Mary's Hospital +1 250 Cherry St., S.E., Grand Rapids 3	Church	320	13,049	Req	44	12	No	250FM	16 Rotating General	31111

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MICHIGAN—Continued										
Bon Secours Hospital +[3] 468 Cadieux Rd., Grosse Pointe 30	Church	158	7,069	Req	60	12	194	315PM	7 Rotating General	90611
Highland Park General Hospital +[1-3] 359 Glendale Ave., Highland Park 3	City	306	11,281	Req	46	12	190	275FM	14 Rotating General	31211
Borgess Hospital +[1-3] 1521 Gull Rd., Kalamazoo 62	NPCorp	285	9,372	None	43	12	No	250FM	6 Rotating General	31311
Bronson Methodist Hospital +[1] 252 E. Lovell St., Kalamazoo 8	Church	250	9,767	Req	57	12	No	240PM	6 Rotating General	31411
Edward W. Sparrow Hospital +[1-3] 1215 E. Michigan Ave., Lansing 12	NPCorp	296	14,934	Req	60	12	195	200PM	16 Rotating General	31511
St. Lawrence Hospital +[1-3] 1210 W. Saginaw St., Lansing 15	Church	275	13,220	None	61	12	No	300FM	12 Rotating General	31611
Midland Hospital [1] 4005 Orchard Dr., Midland	NPCorp	160	7,962	Req	62	12	No	250FM	6 Rotating General	96111
Pontiac General Hospital +[1-3] 461 W. Huron St., Pontiac 18	City	286	13,275	Req	59	12	No	300PM	19 Rotating General	31811
St. Joseph Mercy Hospital +[1-3] 900 Woodward Ave., Pontiac 19	Church	310	16,763	Req	41	12	No	250FM	12 Rotating General	31911
William Beaumont Hospital +[1-3] 3601 W. 13 Mile Rd., Royal Oak	NPCorp	238	12,004	Req	77	12	196	275PM	12 Rotating General	97811
Saginaw General Hospital +[1-3] 1447 N. Harrison St., Saginaw	NPCorp	230	9,512	Req	67	12	No	325	6 Rotating General	32011
St. Luke's Hospital [1] 705 Cooper St., Saginaw 19	Church	211	9,105	Req	55	12	No	400PM	8 Rotating General	32111
St. Mary's Hospital +[3] 830 S. Jefferson Ave., Saginaw 16	Church	172	9,558	Req	50	12	No	350PM	6 Rotating General	32211
James Decker Munson Hospital [1] 6th St., Traverse City	NPCorp	217	7,890	Req	48	12	No	275PM	6 Rotating General	32311
MINNESOTA—Hospitals, 15; Internships, 237										
St. Luke's Hospital +[1-3] 915 E. 1st St., Duluth 11	NPCorp	376	14,700	Req	69	12	186	125FM	18 Rotating General	32411
St. Mary's Hospital +[1] 429 E. 3rd St., Duluth 11	Church	350	11,606	Req	67	12	186	75FM	12 Rotating General	32511
Asbury Methodist Hospital +[1-3] 916 E. 15th St., Minneapolis 4	Church	168	7,541	Req	63	12	198	150FM	8 Rotating General	86711
Minneapolis General Hospital +[1-3]-X44 619 S. 5th St., Minneapolis 15	City	444	7,509	Req	62	12	No	50FM	39 Rotating General	32911
Mount Sinai Hospital +[1-3] 737 E. 22nd St., Minneapolis 4	NPCorp	224	9,765	Req	63	12	No	150FM	14 Rotating General	86811
Northwestern Hospital +[1-3] 810 E. 27th St., Minneapolis 7	NPCorp	262	11,706	Req	73	12	No	175FM	12 Rotating General 1 Straight Medicine 1 Straight Surgery 1 Straight Pediatrics	33011 33032 33033 33034
St. Barnabas Hospital +[1-3] 920 S. 7th St., Minneapolis 4	Church	272	13,715	None	63	12	187	195PM	10 Rotating General	33111
St. Mary's Hospital +[3] 2500 S. 6th St., Minneapolis 6	Church	316	16,090	Req	61	12	No	150FM	10 Rotating General	33211
Swedish Hospital +[1-3] 914 S. 8th St., Minneapolis 4	NPCorp	420	18,161	None	48	12	No	150FM	8 Rotating General	33311
University of Minnesota Hospitals +[1-3]-X44 412 Union St., S. E., Minneapolis 14	State	644	14,114	Req	86	12	200	60FM	11 Straight Medicine 13 Straight Surgery 13 Straight Pediatrics 3 Straight Ob.-Gyn.	33432 33433 33434 33435
Ancker Hospital +[1-3]-X44 495 Jefferson Ave., St. Paul 1	CyCo	850	8,372	Req	64	12	No	75FM	26 Rotating General	33511
Bethesda Hospital [1-3] 559 Capitol Blvd., St. Paul 1	Church	178	9,310	Req	47	12	201	200FM	8 Rotating General	33611
Charles T. Miller Hospital +[1-3] 125 W. College Ave., St. Paul 2	NPCorp	370	12,733	Req	53	12	188	100FM	13 Rotating General	33711
St. Joseph's Hospital +[1] 69 W. Exchange St., St. Paul 2	Church	284	12,195	Req	57	12	No	200FM	12 Rotating General	33811
St. Luke's Hospital +[1-3] 287 N. Smith Ave., St. Paul 2	NPCorp	206	7,628	Req	39	12	202	200FM	4 Rotating General	33911
MISSISSIPPI—Hospitals, 2; Internships, 35										
Mississippi Baptist Hospital +[1-3] 1190 N. State St., Jackson	Church	304	15,359	Req	39	12	No	225PM	12 Rotating General	34011
University Hospital +[1]-X45 2500 N. State St., Jackson	State	355	7,920	Req	52	12	No	200	23 Rotating General	95711
MISSOURI—Hospitals, 26; Internships, 445										
St. Louis County Hospital +[1-3] 601 S. Brentwood Blvd., Clayton 5	County	200	4,225	Req	55	12	No	150FM	10 Rotating General	34211
University of Missouri Medical Center +[1]-X46 807 Stadium Rd., Columbia	State	149	2,721	None	67	12	No	150	4 Straight Pathology	99436
Children's Mercy Hospital +[1-3]-X33 1710 Independence Ave., Kansas City	NPCorp	135	2,417	Req	68	12	No	175FM	1 Straight Pediatrics	98834
Kansas City General Hospitals										
Kansas City General Hospital No. 1 +-X33 24th and Cherry Sts., Kansas City 8	City	378	7,658	Req	62	12	No	150FM	36 Rotating General	34311
Kansas City General Hospital No. 2 +[1-3-4] 600 E. 22nd St., Kansas City 8	City	222	4,920	Req	53	12	No	150FM	See Unit No. 1	
Menorah Medical Center +[1-3]-x33 4949 Rockhill Rd., Kansas City 10	NPCorp	319	10,686	Req	75	12	203	250FM	16 Rotating General	34511
Research Hospital +[1-3] 2300 Holmes St., Kansas City 8	NPCorp	258	8,101	Req	52	12	203	250FM	10 Rotating General	34611
St. Joseph Hospital +[1-3] 2510 E. Linwood Blvd., Kansas City 28	Church	321	13,610	Req	62	12	No	200FM	16 Rotating General 2 Rot. (Surg. Major)	34711 34713
St. Luke's Hospital +[1-3] 4400 J. C. Nichols Pkwy., Kansas City 11	Church	450	14,908	Req	65	12	203	285PM	18 Rotating General	34811

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MISSOURI—Continued										
St. Mary's Hospital +1-3 101 Memorial Dr., Kansas City 8	Church	350	13,028	Req	68	12	203	225FM	12 Rotating General	34911
Trinity Lutheran Hospital 1-3 3001 Wyandotte St., Kansas City 8	Church	200	7,271	Req	58	12	203	200FM	8 Rotating General	35011
Missouri Methodist Hospital +1-3 8th and Faraon Sts., St. Joseph	Church	300	8,993	Req	27	12	No	175FM	4 Rotating General	35111
St. Joseph's Hospital 1-3 923 Powell St., St. Joseph	Church	152	6,398	Req	35	12	No	200FM	4 Rotating General	35211
Barnes Hospital +1-3-X48 600 S. Kingshighway Blvd., St. Louis 10	NPCorp	937	28,734	Req	71	12	No	35FM	10 Str. Med. (Ward) 14 Str. Med. (Pvt.) 14 Straight Surgery 5 Straight Pathology 4 Straight Ob.-Gyn.	35332 35347 35333 35336 35335
Christian Hospital 1-3 4411 N. Newstead Ave., St. Louis 15	Church	135	5,013	Req	43	12	No	175FM	5 Rotating General	35411
De Paul Hospital +1-3 2415 N. Kingshighway Blvd., St. Louis 13	Church	360	13,078	Req	35	12	No	150FM	12 Rotating General	35511
Evangelical Deaconess Hospital 1-3 6150 Oakland Ave., St. Louis 10	Church	322	8,862	Req	45	12	205	150FM	10 Rotating General	35611
Homer G. Phillips Hospital +1-3-4-x48 2601 N. Whittier St., St. Louis 13	City	654	16,740	Req	65	12	No	162FM	40 Rotating General	35711
Jewish Hospital +1-3-4 216 S. Kingshighway Blvd., St. Louis 10	NPCorp	396	11,035	Req	53	12	No	125FM	16 Rotating General 2 Mixed (Med.-Surg.)	35811 35824
Lutheran Hospital +1-3 2639 Miami St., St. Louis 18	Church	317	8,661	Req	40	12	No	150FM	12 Mixed (Med.-Surg.-Ob.-Gyn.)	35922
Missouri Baptist Hospital +1-3 919 N. Taylor Ave., St. Louis 8	Church	483	11,822	Req	34	12	No	125FM	12 Rotating General 2 Rot. Med. Major 2 Rot. Surg. Major	36011 36012 36013
St. Anthony's Hospital +1-3-x47 3520 Chippewa St., St. Louis 18	NPCorp	260	9,388	None	32	12	No	150FM	4 Rotating General	36111
St. John's Hospital +1-3-x47 307 S. Euclid Ave., St. Louis 10	Church	358	11,643	Req	50	12	205	150FM	18 Rotating General	36211
St. Louis Children's Hospital +1-3-X48 500 S. Kingshighway Blvd., St. Louis 10	NPCorp	159	4,083	Req	84	12	206	30FM	8 Straight Pediatrics	86934
St. Louis City Hospital +1-3-X47-48 1515 Lafayette Ave., St. Louis 4	City	1,022	15,943	Req	61	12	No	162PM	40 Rotating General 16 Straight Medicine 8 Straight Surgery 4 Straight Pediatrics	36311 36332 36333 36334
St. Luke's Hospital +1 5535 Delmar Blvd., St. Louis 12	Church	305	8,671	Req	56	12	207	200FM	12 Rotating General	36411
St. Mary's Group of Hospitals +1-X47 1102 S. Grand Blvd., St. Louis 4	Church	335	13,408	Req	63	12	205	85FM	12 Rotating General 8 Straight Medicine 8 Straight Surgery 6 Straight Pediatrics	36511 36532 36533 36531
MONTANA—Hospitals, 3; Internships, 10										
Butte Community Memorial Hospital 1-3 400 S. Clark St., Butte	NPCorp	166	5,806	Req	36	12	No	150FM	2 Rotating General	94711
St. James Hospital 3 Silver and Idaho Sts., Butte	Church	160	5,691	Req	39	12	No	150FM	4 Rotating General	36611
Montana Deaconess Hospital +1-3 1109 6th Ave. N., Great Falls	Church	198	6,896	None	54	12	No	150PM	4 Rotating General	36711
NEBRASKA—Hospitals, 9; Internships, 82										
Bryan Memorial Hospital 1-3-x50 4848 Sumner St., Lincoln 6	Church	125	5,123	Req	55	12	No	300FM	4 Rotating General	36811
Lincoln General Hospital +1-x50 2315 S. 17th St., Lincoln 2	NPCorp	172	6,012	Req	51	12	No	300FM	4 Rotating General	36911
St. Elizabeth Hospital +1-x49 1115 South St., Lincoln 2	Church	260	10,735	Req	45	12	No	300FM	6 Rotating General	37011
Bishop Clarkson Memorial Hospital +1-3-x50 Dewey Ave. at 44th St., Omaha 5	Church	254	9,802	Req	65	12	208	150PM	12 Rotating General	37111
Creighton Memorial St. Joseph Hospital +1-X49 2305 S. 10th St., Omaha 8	Church	616	19,200	Req	38	12	209	185FM	18 Rotating General	37211
Immanuel Hospital +1-x50 34th St. and Fowler Ave., Omaha 11	Church	152	4,968	Req	45	12	210	300	8 Rotating General	37311
Nebraska Methodist Hospital +1-3-x50 3612 Cuming St., Omaha 31	Church	263	8,732	Req	52	12	210	300	10 Rotating General	37411
St. Catherine's Hospital 1-x49 Forest Ave. and 9th St., Omaha 8	Church	200	8,580	Req	47	12	209	300PM	8 Rotating General	37511
University of Nebraska Hospital +1-3-X50 42nd and Dewey Ave., Omaha 5	State	163	3,492	Req	77	12	209	175FM	12 Rotating General	37611
NEW HAMPSHIRE—Hospital, 1; Internships, 16										
Mary Hitchcock Memorial Hospital +1-3 2 Maynard St., Hanover	NPCorp	267	8,171	Req	83	12	No	125PM	16 Rotating General	37711
NEW JERSEY—Hospitals, 41; Internships, 487										
Atlantic City Hospital +1-3 26 S. Ohio Ave., Atlantic City	NPCorp	248	8,801	Req	46	12	211	150FM	12 Rotating General	37811
Bayonne Hospital and Dispensary +1-3 12 E. 30th St., Bayonne	NPCorp	203	7,049	Req	33	12	No	125FM	8 Rotating General	37011
Cooper Hospital +1-X71-x73 6th and Stevens Sts., Camden 3	NPCorp	431	15,161	Req	57	12	No	200FM	12 Rotating General	38011
Our Lady of Lourdes Hospital +1-3-x71 1600 Haddon Ave., Camden 3	Church	278	9,683	Req	55	12	No	200FM	10 Rotating General	93311
West Jersey Hospital +1-3 Mt. Ephraim and Atlantic Aves., Camden 4	NPCorp	275	9,876	Req	28	12	No	200FM	12 Rotating General	38111
East Orange General Hospital 3 S. Munn and Central Aves., East Orange	NPCorp	169	6,315	Req	31	12	No	125FM	5 Rotating General	38211

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NEW JERSEY—Continued										
*Alexian Brothers Hospital ^{3} 655 E. Jersey St., Elizabeth 1	Church	155	4,610	Req	28	12	212	100FM	12 Rotating General	.....
Elizabeth General Hospital and Dispensary $^{1-3}$ 925 E. Jersey St., Elizabeth 4	NPCorp	243	10,655	Req	36	12	No	125FM	12 Rotating General	38411
St. Elizabeth Hospital $^{1-3}$ 234 S. Broad St., Elizabeth 2	Church	207	7,120	Req	31	12	No	100FM	10 Rotating General	38511
Englewood Hospital $^{+1-3}$ 350 Engle St., Englewood	NPCorp	262	9,176	Req	42	12	No	100FM	6 Rotating General	38611
Hackensack Hospital $^{+1-3}$ 22 Hospital Pl., Hackensack	NPCorp	337	13,750	Req	39	12	No	125FM	12 Rotating General	38711
St. Mary's Hospital $^{+1-3}$ 4th St. and Willow Ave., Hoboken	Church	375	7,995	Req	33	12	No	100FM	16 Rotating General	38811
Christ Hospital $^{+1-3}$ 176 Palisade Ave., Jersey City 6	Church	332	9,369	Req	33	12	No	100FM	12 Rotating General	38911
Jersey City Hospital $^{+1-2-4}$-X51 50 Baldwin Ave., Jersey City 4	City	909	18,694	Req	29	12	213	83FM	28 Rotating General 13 Straight Medicine 5 Straight Surgery 2 Straight Pediatrics 1 Straight Pathology	39011 39032 39033 39034 39036
St. Francis Hospital $^{1-3}$ 25 E. Hamilton Pl., Jersey City 2	Church	215	5,922	Req	26	12	213	100FM	9 Rotating General	39111
Monmouth Memorial Hospital $^{+1-2-4}$ 3rd and Pavilion Aves., Long Branch	NPCorp	302	10,768	Req	74	12	No	100FM	12 Rotating General	39211
Mountainside Hospital $^{+1-2-4}$ Bay and Highland Aves., Montclair	NPCorp	327	10,290	Req	49	12	No	200FM	11 Rotating General	39311
Morristown Memorial Hospital $^{+1-3}$ 100 Madison Ave., Morristown	NPCorp	236	9,519	Req	65	12	No	125FM	8 Rotating General	39411
Fitkin Memorial Hospital $^{+1-3}$ Corlies Ave., Neptune	NPCorp	250	10,125	Req	25	12	No	150FM	8 Rotating General	39511
Harrison S. Martland Medical Center $^{+1-2-4}$ 116 Fairmount Ave., Newark 7	City	798	13,320	Req	33	12	No	114FM	30 Rotating General	39811
Newark Beth Israel Hospital $^{+1-2-4}$ 201 Lyons Ave., Newark 12	NPCorp	421	14,869	Req	42	12	No	75FM	13 Rotating General	39711
Presbyterian Hospital $^{+1-3}$ 27 S. 9th St., Newark 7	NPCorp	312	11,860	Req	32	12	214	150FM	6 Rotating General	87211
Saint Barnabas Medical Center $^{+1-3}$ 685 High St., Newark 2	NPCorp	234	7,592	Req	36	12	214	100FM	8 Rotating General	39611
St. Michael's Hospital $^{+1-3}$ 306 High St., Newark 2	Church	422	13,097	Req	50	12	No	140FM	15 Rotating General	39911
Middlesex General Hospital $^{1-3}$ 180 Somerset St., New Brunswick	NPCorp	139	6,857	Req	71	12	215	200FM	10 Rotating General	97911
St. Peter's General Hospital $^{+1-3}$ 290 Easton Ave., New Brunswick	Church	215	9,539	Req	84	12	No	135FM	10 Rotating General	40011
Orange Memorial Hospital $^{+1-3}$ 188 S. Essex Ave., Orange	NPCorp	339	10,441	Req	43	12	No	125FM	10 Rotating General	40111
Bergen Pines County Hospital $^{+1-3}$ E. Ridgewood Ave., Paramus	County	697	3,898	Req	39	12	219	100FM	20 Rotating General	90811
Passaic General Hospital $^{+1-3}$ 350 Boulevard, Passaic	NPCorp	250	9,805	Req	31	12	No	100FM	6 Rotating General	40211
St. Mary's Hospital $^{+1}$ 211 Pennington Ave., Passaic	Church	192	6,895	Req	35	12	No	100FM	6 Rotating General	40311
Nathan and Miriam Barnert Memorial Hospital $^{+1-3}$ 680 Broadway, Paterson 4	NPCorp	147	6,250	Req	41	12	No	100PM	6 Rotating General	40411
Paterson General Hospital $^{+1-3}$ 528 Market St., Paterson 3	NPCorp	347	11,085	Req	32	12	No	100FM	12 Rotating General	40511
St. Joseph Hospital $^{+1-3}$ 703 Main St., Paterson 3	Church	442	12,405	Req	35	12	No	100FM	12 Rotating General	40611
Perth Amboy General Hospital $^{+3}$ 530 New Brunswick Ave., Perth Amboy	NPCorp	358	15,755	None	25	12	No	100FM	14 Rotating General	87311
Muhlenberg Hospital $^{1-2-4}$ Park Ave. and Randolph Rd., Plainfield	NPCorp	367	15,716	Req	37	12	No	140-165FM	10 Rotating General	40711
Somerset Hospital $^{+1-3}$ Rehill Ave., Somerville	NPCorp	213	8,931	Req	37	12	No	150FM	8 Rotating General	93411
Overlook Hospital $^{+1-3}$ 193 Morris Ave., Summit	NPCorp	251	9,525	Req	52	12	No	125FM	12 Rotating General	40811
Holy Name Hospital $^{+1-3}$ 718 Teaneck Rd., Teaneck	Church	248	8,900	Req	41	12	No	150FM	8 Rotating General	40911
Mercer Hospital $^{+1-3}$ 446 Bellevue Ave., Trenton 8	NPCorp	256	9,138	Req	53	12	No	150FM	9 Rotating General	41011
St. Francis Hospital $^{+1-3}$ 601 Hamilton Ave., Trenton 9	Church	361	12,297	Req	42	12	No	150FM	10 Rotating General	41111
William McKinley Memorial Hospital $^{1-3}$ 750 Brunswick Ave., Trenton 8	NPCorp	184	7,019	Req	31	12	No	180-250FM	6 Rotating General	41211
NEW MEXICO—Hospitals, 1; Internships, 10										
Bernalillo County-Indian Hospital $^{+1-3}$ 2211 Lomas Blvd., N.E., Albuquerque	County	215	5,359	Req	62	12	No	250FM	10 Rotating General	96211
NEW YORK—Hospitals, 104; Internships, 1,817										
Albany Hospital $^{+1-3-4}$-X52 New Scotland Ave., Albany 8	NPCorp	635	20,036	Req	62	12	No	135PM	24 Rotating General 5 Straight Medicine 12 Straight Surgery	41411 41432 41433
Memorial Hospital $^{1-3}$-X56 161 N. Pearl St., Albany 7	NPCorp	235	4,357	Req	45	12	No	130FM	14 Rotating General	41511
St. Peter's Hospital $^{+3}$ 632 New Scotland Ave., Albany 8	Church	293	8,664	Req	59	12	222	200FM	10 Rotating General	41611
Binghamton City Hospital $^{+1-3}$ Mitchell and Park Aves., Binghamton	City	332	10,755	Req	49	12-24	No	125FM	15 Rotating General	41811
Lawrence Hospital $^{+1-3}$ 55 Palmer Ave., Bronxville 8	NPCorp	201	6,351	Req	40	12	No	200FM	8 Rotating General	91611

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Name of Hospital and Location	Control	Total Beds	Number of Patients Admitted	Outpatient Service	Autopsy Percentage	Length of Program (Months)	Affiliated Service	Beginning Stipend (Month)	Number and Type of Internships	Code Number
NEW YORK—Continued										
Beth-El Hospital $^{+1-3}$ Linden Blvd. and Rockaway Pkwy. Brooklyn 12	NPCorp	327	9,901	Req	28	12	No	125FM	18 Rotating General	41911
Brooklyn Hospital $^{+1-3-X59}$ 121 De Kalb Ave., Brooklyn 1	NPCorp	340	9,388	Req	48	12	No	160FM	14 Rotating General	42011
Coney Island Hospital $^{+1-3-4}$ Shore and Ocean Pkwy., Brooklyn 35	City	390	6,510	Req	30	12	No	71FM	29 Rotating General	43211
Cumberland Hospital $^{+1-3-4-X59}$ 39 Auburn Pl., Brooklyn 5	City	307	7,583	Req	34	12	No	71FM	7 Rotating General 2 Straight Medicine 2 Straight Surgery 2 Straight Pediatrics	42311 42332 42333 42334
Greenpoint Hospital $^{+1-3-4}$ Kingsland and Skillman Aves., Brooklyn 11	City	158	6,813	Req	28	12	No	71FM	12 Rotating General	42411
Jewish Hospital $^{+1-3-X59}$ 555 Prospect Pl., Brooklyn 38	NPCorp	474	14,892	Req	42	12	296	50FM	28 Rotating General 4 Straight Medicine 3 Straight Pediatrics 2 Straight Ob.-Gyn.	42511 42532 42534 42535
Kings County Hospital Center $^{+1-3-4-X59}$ 451 Clarkson Ave., Brooklyn 3	City	3,167	57,842	Req	33	12	No	71FM	114 Rotating General 10 Straight Medicine 10 Straight Surgery 3 Straight Pediatrics 1 Straight Pathology	42611 42632 42633 42634 42636
Long Island College Hospital $^{+1-3-X59}$ 340 Henry St., Brooklyn 1	NPCorp	401	11,862	Req	35	12	No	131PM	19 Rotating General 2 Straight Medicine 2 Straight Surgery	42711 42732 42733
Lutheran Hospital $^{1-3}$ 22 Junius St., Brooklyn 12	Church	155	5,918	Req	37	12	No	150FM	8 Rotating General	97211
Lutheran Medical Center $^{+1-3}$ 4520 4th Ave., Brooklyn 20	Church	206	6,699	Req	56	12	No	110PM	10 Rotating General	43011
Maimonides Hospital $^{+1-3-X59}$ 4802 10th Ave., Brooklyn 19	NPCorp	515	14,546	Req	36	12	No	50FM	24 Rotating General 7 Straight Medicine	42811 42832
Methodist Hospital $^{+1-3-X59}$ 506 6th St., Brooklyn 15	Church	387	11,160	Req	38	12	No	150FM	12 Rotating General 2 Straight Medicine 1 Straight Surgery 1 Straight Pediatrics	42911 42932 42933 42934
Prospect Heights Hospital $^{1-3}$ 775 Washington Ave., Brooklyn 38	NPCorp	168	5,635	None	33	12	No	200PM	6 Rotating General	87411
St. Catherine's Hospital $^{+1-3}$ 133 Bushwick Ave., Brooklyn 6	Church	281	7,671	Req	29	12	No	125FM	10 Rotating General	43111
St. John's Episcopal Hospital $^{+1-3}$ 480 Herkimer St., Brooklyn 13	Church	251	8,277	Req	32	12	No	160FM	9 Rotating General 2 Straight Medicine 3 Straight Surgery 1 Straight Pediatrics	43211 43232 43233 43234
St. Mary's Hospital $^{+1-3}$ 1298 St. Marks Ave., Brooklyn 13	Church	234	5,713	Req	42	12	No	125FM	8 Rotating General	43311
St. Peter's Hospital $^{1-3}$ 380 Henry St., Brooklyn 1	Church	200	4,212	Req	22	12	No	100FM	10 Rotating General	96711
Unity Hospital $^{+1-3}$ 1545 St. Johns Pl., Brooklyn 13	NPCorp	210	6,501	Req	31	12	No	100FM	8 Rotating General	43411
Wyckoff Heights Hospital $^{+1-3}$ 374 Stockholm St., Brooklyn 37	NPCorp	258	8,976	Req	32	12	No	100FM	8 Rotating General	43511
Allied Hospitals of the Sisters of Charity $^{+1-3}$ (Sisters of Charity and Emergency Hospitals) 2157 Main St., Buffalo 14	Church	446	17,600	Req	30	12	223	225FM	18 Rotating General	44111
Buffalo General Hospital $^{+1-3-4-X53}$ 100 High St., Buffalo 3	NPCorp	644	17,648	Req	56	12	No	150-200FM	23 Rotating General 3 Straight Medicine	43611 43632
Children's Hospital $^{+1-3-X53}$ 219 Bryant St., Buffalo 22	NPCorp	260	13,070	Req	93	12	No	100FM	4 Straight Pediatrics	90531
Deaconess Hospital $^{+1-3}$ 563 Riley St., Buffalo 8	NPCorp	286	10,552	Req	37	12	224	250FM	14 Rotating General	43711
Edward J. Meyer Memorial Hospital $^{+1-3-4-X53}$ 462 Grider St., Buffalo 15	County	990	13,089	Req	42	12	No	231PM	24 Rotating General	43811
Mercy Hospital $^{+1-3}$ 565 Abbott Rd., Buffalo 20	Church	360	12,919	Req	43	12	298	200FM	20 Rotating General	43911
Millard Fillmore Hospital $^{+1-3-4-X53}$ 3 Gates Circle, Buffalo 9	NPCorp	524	18,783	Req	48	12	224	260	15 Rotating General	44011
Mary Imogene Bassett Hospital $^{+1-3-X52-X55}$ Atwell Rd., Cooperstown	NPCorp	111	3,149	Req	61	12	No	110PM	9 Rotating General 1 Straight Medicine	44211 44232
Elmhurst General Hospital $^{+1-3-4}$ 79-01 Broadway, Elmhurst 73 (Replacing New York City Hospital)	City	823	11,572	Req	25	12	No	71FM	33 Rotating General 3 Straight Surgery	49111 49133
Arnot Ogden Memorial Hospital $^{+1-3}$ Roe Ave., Elmira	NPCorp	213	8,445	Req	43	12	No	200FM	4 Rotating General	44311
St. Joseph's Hospital $^{+1-3}$ 555 E. Market St., Elmira	Church	222	8,939	Req	41	12	No	300PM	4 Rotating General	44411
Flushing Hospital and Dispensary $^{+1-3-4}$ 44-14 Parsons Blvd., Flushing 55	NPCorp	312	12,311	Req	50	12	No	150FM	12 Rotating General	44511
Community Hospital $^{+1-3}$ St. Andrews Lane, Glen Cove	NPCorp	183	8,433	Req	51	12	No	200FM	8 Rotating General	44611
Glens Falls Hospital $^{+1-3}$ 100 Park St., Glens Falls	NPCorp	256	11,980	Req	40	12	No	200FM	8 Rotating General	44711
Meadowbrook Hospital $^{+1-3}$ Bethpage Tpke. and Carman Ave., Hempstead	County	600	15,207	Req	46	12	No	150FM	36 Rotating General	44811
Mary Immaculate Hospital $^{+1-3-4}$ 152-11 89th Ave., Jamaica 32	Church	295	9,198	Req	29	12	No	150FM	8 Rotating General	45011
Queens General Hospital $^{+1-3-4}$ 82-68 164th St., Jamaica 32	City	1,436	15,206	Req	35	12	No	71FM	36 Rotating General	45111
Charles S. Wilson Memorial Hospital $^{+1-3}$ 33 Harrison St., Johnson City	NPCorp	450	13,346	Req	42	12	No	200PM	12 Rotating General	45211
Our Lady of Victory Hospital $^{+3}$ 800 Ridge Rd., Lackawanna 18	Church	260	9,113	Req	25	12	No	150FM	9 Rotating General	45311

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NEW YORK—Continued										
St. John's Long Island City Hospital +1-3.... 25-01 Jackson Ave., Long Island City 1	Church	222	6,002	Req	36	12	220	125FM	16 Rotating General	45411
Nassau Hospital +1-3........................ 1st St., Mineola	NPCorp	315	13,420	Req	50	12	No	150FM	8 Rotating General	45511
Northern Westchester Hospital 1-3............ E. Main St., Mount Kisco	NPCorp	145	5,118	Req	44	12	No	100FM	4 Rotating General	45611
Mount Vernon Hospital +1-3.................... 12 N. 7th Ave., Mount Vernon	NPCorp	253	9,366	Req	47	12	No	100FM	12 Rotating General	45711
St. Luke's Hospital 1-3-4........................ 70 DuBois St., Newburgh	NPCorp	188	7,753	Req	33	12	No	200FM	8 Rotating General	45811
Long Island Jewish Hospital +1-3-4........... 270-05 76th Ave., New Hyde Park	NPCorp	249	9,039	Req	66	12	No	50FM	14 Rotating General	96311
New Rochelle Hospital +1-3-4..................... 16 Guion Pl., New Rochelle	NPCorp	305	10,536	Req	32	12	No	200FM	12 Rotating General	45911
Bellevue Hospital Center +1-3-4-X55-56-58....... 1st Ave. and 27th St., New York 16	City	2,684	46,872	Req	41	12	...	71FM		
First Medical Division— Columbia University +1-3...................... Dr. Dickinson W. Richards	....	...	.....	Req	...	12	No	71FM	12 Mixed (Med.-Chest Surg. or Path.)	46067
First Surgical Division— Columbia University +1-3...................... Dr. Kenneth M. Lewis, Sr.	....	...	.....	Req	...	12	No	71FM	2 Straight Surgery 4 Mixed (Surg.-Med.)	46133 46124
Second Medical Division— Cornell University +1-3......................... Dr. Thomas P. Almy	....	...	.....	Req	...	12	225	71FM	21 Straight Medicine 2 Mixed (Med.-Path.)	46232 46227
Second Surgical Division— Cornell University +1-3......................... Dr. Cranston W. Holman	....	...	.....	Req	...	12	No	71FM	7 Straight Surgery	46333
Third Medical Division— New York Univ. Col. of Med. +1-3............ Dr. William S. Tillett	....	...	.....	Req	...	12	No	71FM	12 Straight Medicine 4 Mixed (Surg.-Med.)	46432 46524
Third Surgical Division— New York Univ. Col. of Med. +1-3............ Dr. John H. Mulholland	....	...	.....	Req	...	12	No	71FM	6 Straight Surgery 4 Mixed (Surg.-Med.)	46533 46524
Third Division, Dept. of Pathology— New York Univ. Col. of Med. +1-3.......... Dr. Marvin Kuschner	....	...	.....	...	...	12	No	71FM	1 Straight Pathology	93036
Third Division, Dept. of Pediatrics— New York Univ. Col. of Med. +1-3...... ... Dr. L. Emmett Holt, Jr.	....	...	.....	Req	...	12	No	71FM	9 Straight Pediatrics	92934
Fourth Medical Division— New York Univ. Post-Graduate Medical School +1-3................................. Dr. Charles F. Wilkinson, Jr.	....	...	.....	...	...	12	226	71FM	11 Straight Medicine	46632
Fourth Surgical Division— New York Univ. Post-Graduate Medical School +1-3-4............................... Dr. J. William Hinton	....	...	.....	Req	...	12	No	71FM	8 Straight Surgery	46733
Beth David Hospital +1-3......................... 321 E. 42nd St., New York 17	NPCorp	171	4,437	Req	36	12	No	100PM	14 Rotating General	46911
Beth Israel Hospital +1-3-4...................... 10 Nathan D. Perlman Pl., New York 3	NPCorp	251	9,156	Req	40	12	No	110PM	16 Rotating General	47011
Bronx Hospital +1-3-4........................... 1276 Fulton Ave., New York 56	NPCorp	329	8,741	Req	33	12	No	75FM	9 Rotating General	47111
Bronx Municipal Hospital Center +1-3-4-X54.. Pelham Pkwy. and Eastchester Rd. New York 61	City	1,091	7,109	Req	56	12	No	105FM	16 Straight Medicine 12 Straight Surgery 10 Straight Pediatrics	93132 93133 93134
Columbus Hospital +3............................. 227 E. 19th St., New York 3	Church	350	7,228	Req	41	12	No	75FM	12 Rotating General	47211
Fordham Hospital +1-3-4......................... Southern Blvd. and Crotona Ave. New York 58	City	414	7,989	Req	37	12	No	71FM	18 Rotating General	47411
French Hospital +1-3............................. 330 W. 30th St., New York 1	NPCorp	237	6,087	Req	39	12	No	75FM	10 Rotating General	47511
Harlem Hospital +1-3-4........................... 532 Lenox Ave., New York 37	City	798	16,656	Req	28	12	No	71FM	42 Rotating General	47811
Hospital for Joint Diseases +1-3-4........... 1919 Madison Ave., New York 35	NPCorp	305	5,924	Req	42	12	227	50FM	6 Rotating General	47911
Jewish Memorial Hospital +1-3-4............. 196th St. and Broadway, New York 40	NPCorp	185	6,147	Req	45	12	No	75FM	10 Rotating General	48011
Knickerbocker Hospital +1-3.................... 70 Convent Ave., New York 27	NPCorp	220	4,597	Req	47	12	231	125FM	6 Rotating General 3 Straight Medicine 3 Straight Surgery	48111 48132 48133
Lebanon Hospital +1-3............................ 1650 Grand Concourse, New York 57	NPCorp	260	7,291	Req	41	12	No	50FM	13 Rotating General 1 Straight Surgery	48211 48233
Lenox Hill Hospital +1-3-4....................... 111 E. 76th St., New York 21	NPCorp	431	12,172	Req	47	12	221	100PM	23 Rotating General	48311
Lincoln Hospital +1-3-4........................... 320 Concord Ave., New York 54	City	404	12,267	Req	27	12	No	71FM	12 Rotating General	48411
Misericordia Hospital +1-3..................... 531 E. 86th St., New York 28	Church	185	4,711	Req	38	12	No	75FM	10 Rotating General	48611
Montefiore Hospital +1-3-4-X55................ 210th St. and Bainbridge Ave., New York 67	NPCorp	651	9,743	None	49	12	No	55FM	28 Mixed (Med.-Surg.-Pul.-Neuro.-Neoplastic)	48785
Morrisania City Hospital +1-3-4............... 1230 Gerard Ave., New York 52	City	461	10,636	Req	29	12	No	71FM	18 Rotating General	48811
Mother Cabrini Memorial Hospital +1-3....... 611 Edgecombe Ave., New York 32	Church	170	3,755	Req	25	12	No	100FM	8 Rotating General	48911
Mount Sinai Hospital +1-4-X55................ 1 E. 100th St., New York 29	NPCorp	1,007	24,373	Req	50	12	No	40FM	43 Rotating General	49011

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NEW YORK—Continued										
New York City Hospital Welfare Island, New York 17 (Replaced by Emhurst General Hospital, Elmhurst 73)										
New York Hospital +1-3-4-X56 525 E. 68th St., New York 21	NPCorp	1,431	25,556	None	66	12	No	143PM	18 Straight Medicine 16 Straight Surgery 2 Straight Pediatrics 2 Straight Pathology	49232 49233 49234 49236
New York Infirmary +2 Stuyvesant Sq. E. and 15th St., New York 3	NPCorp	192	4,235	Req	34	12	No	100FM	7 Rotating General	87511
New York Polyclinic Medical School and Hospital +1-3-4 345 W. 50th St., New York 19	NPCorp	394	9,085	Req	55	12	No	100FM	8 Rotating General	49411
Presbyterian Hospital +1-4 622 W. 168th St., New York 32	NPCorp	1,516	37,790	Req	61	12	No	208	12 Straight Medicine 12 Straight Surgery 3 Straight Pathology	49532 49533 49536
Roosevelt Hospital +1-3-4-X55 428 W. 59th St., New York 19	NPCorp	161	9,574	Req	48	12	No	100PM	8 Mixed (Med.-Ped.-Surg.) 7 Mixed (Surg.-Gyn.-Med)	49623 49672
St. Clare's Hospital +1-3 415 W. 51st St., New York 19	Church	110	10,964	Req	34	12	No	175PM	13 Rotating General 2 Straight Surgery 1 Straight Medicine	49711 49733 49732
St. Francis Hospital +1-3 525 E. 142nd St., New York 54	Church	372	9,311	Req	19	12	No	100FM	12 Rotating General	49811
St. Luke's Hospital +1-3-4-X55 421 W. 113th St., New York 25	NPCorp	523	10,726	Req	58	12	No	50FM	8 Mixed (9 mo. Med.-3 mo. Surg.) 8 Mixed (9 mo. Surg.-3 mo. Med.) 2 Straight Pediatrics	49983 49984 49931
St. Vincent's Hospital +1-3-x58 153 W. 11th St., New York 11	Church	768	17,799	Req	53	12	228	80FM	23 Rotating General 4 Straight Medicine 6 Straight Surgery	50011 50032 50033
Sydenham Hospital +1-3-4 565 Manhattan Ave., New York 27	City	220	5,356	Req	32	12	No	71FM	9 Rotating General	50111
Mount St. Mary's Hospital 1-3 515 6th St., Niagara Falls	Church	189	6,708	Req	47	12	No	275FM	6 Rotating General	50311
Niagara Falls Memorial Hospital 1-3 621 10th St., Niagara Falls	NPCorp	302	10,882	None	46	12	No	200FM	9 Rotating General	93511
United Hospital +1-3 406 Boston Post Rd., Port Chester	NPCorp	220	7,111	Req	28	12	No	200PM	8 Rotating General	50411
Vassar Brothers Hospital +1-3 Reade Pl., Poughkeepsie	NPCorp	218	8,056	Req	44	12	No	200FM	8 Rotating General	50611
Genesee Hospital +1-3-x60 224 Alexander St., Rochester 7	NPCorp	252	10,842	Req	84	12	No	167	8 Rotating General 4 Straight Medicine 4 Straight Surgery 1 Straight Pathology	50711 50732 50733 50736
Highland Hospital +1-3-x60 South Ave. at Bellevue Dr., Rochester 20	NPCorp	240	8,803	Req	60	12	229	150-200FM	9 Rotating General 3 Straight Surgery	50811 50833
Rochester General Hospital +1-3-4-x60 1425 Portland Ave., Rochester 21	NPCorp	412	13,982	Req	71	12	No	100FM	18 Rotating General 2 Straight Medicine 2 Straight Surgery	50911 50932 50933
St. Mary's Hospital +1-3-x60 89 Genesee St., Rochester 11	Church	330	14,052	Req	55	12	No	205FM	15 Rotating General	51011
Strong Memorial-Rochester Municipal Hospitals +1-3-X60 260 Crittenden Blvd., Rochester 20	NPCorp	477	14,189	Req	69	12-24	No	81-96	12 Rotating General (24 Mo.) 11 Straight Medicine 8 Straight Surgery 6 Straight Pediatrics 4 Straight Pathology 4 Mixed (Surg.-Ob.-Gyn.)	51116 51132 51133 51134 51136 51126
Ellis Hospital +1-3-x52 1101 Nott St., Schenectady 8	NPCorp	357	16,881	Req	51	12	No	125FM	18 Rotating General	51211
St. Clare's Hospital 1-3 600 McClellan St., Schenectady 4	Church	204	7,034	Req	31	12	No	150FM	8 Rotating General	51311
St. Vincent's Hospital +1-3 355 Bard Ave., Staten Island 10	Church	252	9,680	Req	34	12	No	190PM	8 Rotating General	51411
Staten Island Hospital +1-3 101 Castleton Ave., Staten Island 1	NPCorp	215	8,558	Req	30	12	No	100FM	8 Rotating General	51511
General Hospital +1-3-x61 116 E. Castle St., Syracuse 5	NPCorp	121	5,838	Req	33	12	No	191	3 Mixed (Med.-Surg.-Ob.-Gyn.)	51722
St. Joseph's Hospital +1-X61 301 Prospect Ave., Syracuse 3	Church	301	12,635	Req	39	12	No	208SPM	12 Rotating General	51811
State University of New York Upstate Medical Center Hospitals (University Hospital of the Good Shepherd, Crouse-Irving and Syracuse Memorial Hospitals) +1-3-X61 766 Irving Ave., Syracuse 10	NPCorp	689	27,392	Req	53	12	No	208	16 Rotating General 7 Straight Medicine 6 Straight Surgery 3 Straight Pediatrics 4 Mixed (Med.-Surg.)	51611 51632 51633 51634 51624
Leonard Hospital 1-3 44 114th St., Troy	NPCorp	163	6,255	Req	25	12	245	150FM	7 Rotating General	96911
St. Mary Hospital 1-3 87 Oakwood Ave., Troy	Church	225	6,264	Req	41	12	No	175FM	6 Rotating General	51911
Samaritan Hospital +1-3 Peoples and Burdett Aves., Troy	NPCorp	166	7,034	Req	40	12	No	250FM	9 Rotating General	52011
Grasslands Hospital +1-3-4 Valhalla	County	647	4,982	Req	55	12	No	150FM	10 Mixed (Med.-Ped.-Surg) 10 Mixed (Surg.-Med.-Ob.)	52123 5216
White Plains Hospital +1-3 41 E. Post Rd., White Plains	NPCorp	198	6,905	Req	48	12	No	150FM	8 Rotating General	52311

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NEW YORK—Continued										
St. John's Riverside Hospital +[1-3] 65 Ashburton Ave., Yonkers	NPCorp	214	6,791	Req	32	12	No	120FM	8 Rotating General	52411
St. Joseph's Hospital 127 S. Broadway, Yonkers	Church	174	4,318	...	33	12	...	100FM	8 Rotating General	52511
Yonkers General Hospital [1-3] 127 Ashburton Ave., Yonkers	NPCorp	143	5,153	Req	36	12	No	100FM	7 Rotating General	52611
NORTH CAROLINA—Hospitals, 10; Internships, 192										
Memorial Mission Hospital of Western North Carolina [1] 509 Biltmore Ave., Asheville	NPCorp	329	11,858	Req	29	12	No	250PM	8 Rotating General	94911
North Carolina Memorial Hospital +[1-2]-X62 Pittsboro Rd., Chapel Hill	State	350	8,811	Req	73	12	240	150	10 Straight Medicine 8 Straight Surgery 4 Straight Pediatrics 3 Straight Pathology 12 Mixed (Med.-Ped.)	90032 90033 90034 90036 90048
Charlotte Memorial Hospital +[1-4] 1400 Scott Ave., Charlotte 3	NPCorp	352	13,787	Req	77	12	No	200FM	10 Rotating General	52711
Duke Hospital +[1-3]-X63 Durham	NPCorp	546	16,594	Req	59	12	No	25FM	24 Straight Medicine 16 Straight Surgery 10 Straight Pediatrics 3 Straight Pathology 1 Straight Ob.-Gyn. 4 Mixed (Ob.-Ped.)	52932 52933 52934 52936 52935 52938
Watts Hospital +[1-2]-x62-63 Club Blvd., Durham	NPCorp	281	10,708	Req	41	12	No	250FM	10 Rotating General 2 Straight Medicine 2 Straight Ob.-Gyn.	87711 87732 87735
Moses H. Cone Memorial Hospital +[1-3] 1200 N. Elm St., Greensboro	NPCorp	255	11,073	Req	65	12	No	300PM	12 Rotating General	94311
Rex Hospital +[1]-x62 1311 St. Mary's St., Raleigh	NPCorp	310	14,008	Req	33	12	No	300	12 Rotating General	53211
City Memorial Hospital +[1-2] 1 Hospital St., Winston-Salem 4	City	294	12,791	Req	44	12	No	250PM	16 Rotating General	53511
Kate Bitting Reynolds Memorial Hospital +[1-2] 1101 E. 7th St., Winston-Salem 4	City	176	6,963	Req	27	12	No	250PM	6 Rotating General	53611
North Carolina Baptist Hospital +[1-4]-X64 300 S. Hawthorne Rd., Winston-Salem 7	Church	400	14,024	Req	58	12	No	83PM	8 Straight Medicine 8 Straight Surgery 3 Straight Pediatrics 3 Straight Pathology 2 Mixed (Med.-Ob.-Gyn.-Ped.)	53732 53733 53734 53736 53721
NORTH DAKOTA—Hospitals, 3; Internships, 18										
St. John's Hospital [1-3] 365 6th Ave. S., Fargo	Church	175	6,828	Req	52	12	No	225FM	6 Rotating General	87011
St. Luke's Hospital +[3] 727 Broadway, Fargo	NPCorp	185	7,846	Req	42	12	No	225FM	8 Rotating General	53911
Grand Forks Deaconess Hospital [1-3] 222 S. 4th St., Grand Forks	NPCorp	150	6,138	Req	63	12	No	175FM	4 Rotating General	54011
OHIO—Hospitals, 53; Internships, 813										
Akron City Hospital +[1-3] 525 E. Market St., Akron 9	NPCorp	480	17,590	Req	52	12	232	200FM	24 Rotating General	54111
Akron General Hospital +[1] 400 Wabash Ave., Akron 7	NPCorp	395	14,489	Req	46	12	232	200FM	20 Rotating General	54211
St. Thomas Hospital +[1-3] 444 N. Main St., Akron 10	Church	288	10,801	Req	52	12	233	200FM	15 Rotating General	54311
Barberton Citizens Hospital +[1-3] Tuscora Park, Barberton	NPCorp	235	10,075	Req	44	12	No	225-400FM	12 Rotating General	96411
Aultman Hospital +[1-3] 625 Claredon Ave., S.W., Canton 10	NPCorp	482	17,256	Req	41	12	No	250PM	18 Rotating General	54411
Mercy Hospital +[1-3] 723 Market Ave., N., Canton 2	Church	399	14,281	Req	47	12	No	125FM	12 Rotating General	54511
Bethesda Hospital +[1-3] Oak and Reading Rd., Cincinnati 6	Church	235	10,063	Req	47	12	234	210PM	6 Rotating General 4 Mixed (Med.-Ob.-Surg.)	54611 54669
Christ Hospital +[1] 2139 Auburn Ave., Cincinnati 19	NPCorp	356	11,465	Req	47	12	234	175FM	13 Rotating General	54711
University of Cincinnati Hospitals Group Cincinnati General Hospital +[1-4]-X65 3231 Burnet Ave., Cincinnati 29	City	815	16,140	Req	63	12	235	100FM	52 Rotating General	54811
Good Samaritan Hospital +[1-3] 3217 Clifton Ave., Cincinnati 20	Church	591	20,491	None	40	12	No	200FM	16 Rotating General	55011
Jewish Hospital +[1-3] Burnet Ave., Cincinnati 29	NPCorp	387	16,481	Req	52	12	No	175FM	16 Rotating General	55111
St. Mary's Hospital +[1-3] 810 Betts St., Cincinnati 14	Church	204	5,547	Req	43	12	No	200FM	12 Rotating General	55211
Cleveland Clinic Hospital + 2020 E. 93rd St., Cleveland 6	NPCorp	457	13,547	Req	66	12	241	100FM	12 Rotating General 4 Straight Surgery	96811 96833
Cuyahoga County Hospital +[1-3-4]-X66 3395 Scranton Rd., Cleveland 9	County	894	9,949	Req	59	12	No	92FM	16 Rotating General 4 Straight Medicine 4 Straight Surgery 2 Straight Pediatrics	55311 55332 55333 55334
Evangelical Deaconess Hospital +[1-3] 4229 Pearl Rd., Cleveland 9	Church	209	10,252	Req	38	12	No	100FM	12 Rotating General	90911
Fairview Park Hospital +[1-3] 18101 Lorain Ave., Cleveland 11	Church	294	11,524	Req	46	12	No	100FM	12 Rotating General	55411
Huron Road Hospital +[1-3] 13951 Terrace Rd., Cleveland 12	NPCorp	291	11,133	Req	50	12	No	200FM	12 Rotating General	57111
Lutheran Hospital +[1-3] 2609 Franklin Blvd., Cleveland 13	Church	189	7,524	Req	62	12	No	235PM	12 Rotating General	55611
Mount Sinai Hospital +[1-4] 1800 E. 105th St., Cleveland 6	NPCorp	348	14,469	Req	48	12	No	150FM	18 Rotating General	55711

Hospitals designated with an asterisk (*) in this listing do not participate in the National Intern Matching Program, sponsored by the American Medical Association, the American Hospital Association, the Association of American Medical Colleges, and other cooperating organizations.

Abbreviations and other references will be found on pages 553 through 555.

111. City of Hope Medical Center, Duarte, Calif.
112. Los Angeles County Hospital, Los Angeles
113. U. S. Naval Hospital, San Diego, Calif.
114. Mary's Help Hospital, Children's Hospital, San Francisco; Southern Pacific Hospital and Sanatorium, Tucson, Ariz.
115. Children's Hospital, San Francisco
116. Agnews State Hospital, Agnew, Calif.
117. California Hospital, Los Angeles
118. St. Francis Hospital, Colorado Springs, Colo.
119. St. Luke's Hospital, St. Joseph's Hospital, Presbyterian Hospital, Porter Sanitarium and Hospital, Denver
120. University of Colorado Medical Center, Denver
121. Children's Hospital, Denver
122. Denver General Hospital, Colorado General Hospital, Children's Hospital, Denver
123. Hospital of St. Raphael, New Haven, Conn.
124. Yale-New Haven Medical Center, New Haven, Conn.
125. Hartford Hospital, Hartford, Conn.
126. Laguna Honda Home, San Francisco
127. Children's Hospital, Washington, D. C.
128 District of Columbia General Hospital, Washington, D. C.
129 DeWitt Army Hospital, Fort Belvoir, Va ; U. S. Air Force Hospital, Washington, D. C.
130. Children's Hospital, District of Columbia General Hospital, Washington, D. C.
131. Duval Medical Center, Jacksonville, Fla.
132. Variety Children's Hospital, Miami, Fla.
133. Jackson Memorial Hospital, Miami, Fla.
134. Grady Memorial Hospital, Atlanta, Ga.
135. University Hospital, Augusta, Ga.
136. Maricopa County General Hospital, Phoenix, Ariz.
137. Children's Hospital, St. Joseph's Hospital, San Francisco
138 Santa Barbara General Hospital, Santa Barbara, Calif.
139. Arlington Hospital, Arlington, Va.
140. Escambia County Health Department Clinic, Pensacola, Fla.
141. Clara Frye Municipal Hospital, Tampa, Fla
142 Mercy Hospital, St. Petersburg, Fla.
144. Children's Memorial Hospital, Chicago
145. Cook County Hospital, Frank Cuneo Memorial Hospital, Chicago
148. Mercy Hospital, Chicago
149. Lewis Memorial Maternity Hospital, Chicago
150. Northern Indiana Children's Hospital, South Bend, Ind.
151. Booth Memorial Hospital, Des Moines, Iowa
152. Broadlawns Polk County Hospital, Des Moines, Iowa
153 Mercy Hospital, Kansas City, Kan.
154. Sedgwick County Hospital, Booth Memorial Hospital, Wichita, Kan.
155 Halstead Hospital, Halstead, Kan.
156. St. Joseph Infirmary, Louisville, Ky.
157. Charity Hospital of Louisiana, New Orleans, La.
158 Confederate Memorial Medical Center, Shreveport, La.
159. Indianapolis General Hospital, Indianapolis
160. Children's Mercy Hospital, Kansas City, Mo.
161. University I[illegible], Md.
162. Peninsula G[illegible]ice, R I.
163. Charles V. C[illegible] Mass
164. St. Margare[illegible]
165. Beth Israel [illegible]
166. Haynes Memorial Hospital, Brighton, Mass
167. Boston City Hospital, Boston; Veterans Administration Hospital, Providence, R. I.
168 Eastern Maine General Hospital, Bangor, Maine; Central Maine General Hospital, Lewiston, Maine; Boston Floating Hospital, Boston; Burbank Hospital, Fitchburg, Mass
169. Boston Floating Hospital, Boston
170. Robert Breck Brigham Hospital, Boston
171. St. Margaret's Hospital, Boston City Hospital, Boston
172. Boston Lying-In Hospital, Boston
173 Fall River General Hospital, Fall River, Mass
174. Addison Gilbert Hospital, Gloucester, Mass.
175. Wesson Maternity Hospital, Springfield, Mass
176. Beyer Memorial Hospital, Ypsilanti, Mich.; Blodgett Memorial Hospital, Grand Rapids, Mich.; McLaren General Hospital, Flint, Mich.; Mercy Hospital, Benton Harbor, Mich.; Midland Hospital, Midland, Mich.; Saginaw General Hospital, Saginaw, Mich.; St. Joseph Mercy Hospital, Ann Arbor, Mich.
177. Wayne County General Hospital and Infirmary, Eloise, Mich , Herman Kiefer Hospital, Detroit
178. Receiving Hospital, Children's Hospital, Detroit
179. Harper Hospital, Detroit
180. Receiving Hospital, Children's Hospital, Detroit
181. Herman Kiefer Hospital, Detroit; St. Joseph's Retreat, Dearborn, Mich.; Wayne County General Hospital and Infirmary, Eloise, Mich.
182 Herman Kiefer Hospital, Receiving Hospital-Redford Branch, Detroit
183. Southbury Training School, Southbury, Conn ; Veterans Administration Hospital, West Haven, Conn.
184. University Hospital, Baltimore
185. Baltimore City Hospital, Baltimore
186. Miller Memorial Hospital, Duluth, Minn.
187. University of Minnesota Hospitals, Minneapolis
188 Children's Hospital, St. Paul
190. Children's Hospital, Detroit
191. Herman Kiefer Hospital, Women's Hospital, Detroit
192. Genesee County Tuberculosis Sanatorium, Flint, Mich.
193. Evangeline Home and Hospital, Michigan Veterans Facility Hospital, Mary Free Bed Convalescent Home, Grand Rapids, Mich.
194. Children's Hospital, Receiving Hospital, Herman Kiefer Hospital, Detroit
195. Ingham Chest Hospital, Lansing, Mich
196. Pontiac State Hospital, Pontiac, Mich.
198. North Memorial Hospital, Minneapolis
200. Anoka State Hospital, Anoka, Minn.; Children's Hospital, St. Paul; Elizabeth Kenny Institute, Minneapolis
201. Gillette State Hospital for Crippled Children, Children's Hospital, St Paul
202. Charles T. Miller Hospital, Children's Hospital, St. Paul
203. Children's Mercy Hospital, Kansas City, Mo.
205. St. Louis City Hospital, St. Louis
206. St. Louis Maternity Hospital, St. Louis; St. Louis County Hospital, Clayton, Mo.; Burge Hospital, Springfield, Mo
207. St. Louis Children's Hospital, St. Louis
208. Douglas County Hospital, Children's Memorial Hospital, Omaha
209. Douglas County Hospital, Omaha
210. Children's Memorial Hospital, Omaha
211. Children's Seashore Home, Atlantic City, N. J.; Clyde Fish Memorial Hospital, Northfield, N. J.; Betty Bacharach Home for Crippled Children, Longport, N. J.
212. St. Peter's General Hospital, New Brunswick, N. J.; St. Elizabeth Hospital, Elizabeth, N. J.
213. Margaret Hague Maternity Hospital, Jersey City, N. J.
214. Babies Hospital, Newark, N. J.
215. Roosevelt Hospital, New York City; Middlesex Rehabilitation and Polio Hospital, New Brunswick, N. J.
217. Johns Hopkins Hospital, Baltimore
218. [illegible] Ky.
219. [illegible] ssaic, N. J ; Nathan and Miriam [illegible] Paterson, N. J.; Perth Amboy [illegible] boy, N. J.
220. [illegible] klyn
221. [illegible] mington, N. J.
222. [illegible], N. Y.
223. [illegible]
224. [illegible]
225. [illegible] nd Allied Diseases, New York City
226. University Hospital, New York City
227. Jewish Hospital, Brooklyn
228. Hunterdon Medical Center, Flemington, N. J.
229. Strong Memorial Hospital, Rochester, N. Y.
230. Staten Island Hospital, St. Vincent's Hospital, Staten Islan N. Y.
231. Lincoln Hospital, Bronx, N. Y.
232. Children's Hospital, Akron, Ohio
233. Children's Hospital, Summit County Receiving Hospital, Akro Ohio
234. Children's Hospital, Cincinnati
235. Daniel Drake Memorial Hospital, Dunham Hospital, Cincinnat
236. Children's Hospital, Columbus, Ohio
237. [illegible] Receiving Hospital, Ohio Tuberculosis Hospital, Cl [illegible] umbus, Ohio
238. [illegible] ospital, Cleveland
239. [illegible] oledo, Ohio
240. [illegible] Chapel Hill, N. C.
241. [illegible] al, Cleveland
242. [illegible] eveland
243. [illegible] Lima, Ohio
244. Toledo State and Receiving Hospitals, William Roche Memo Hospital, Maumee Valley Hospital, Toledo, Ohio
245. Homer Folks Tuberculosis Hospital, Oneonta, N. Y.
246. University of Oklahoma Hospitals, Oklahoma City
247. St. Vincent's Ho [illegible] Hospital, Portland, Ore
248. Providence Hosp [illegible]
249. Lawrence F. Flic [illegible] Pa.
250. Hospital of the [illegible] Philadelphia
251. [illegible] Dispensary and Hospital, Philadelphia Psychiatric [illegible] for Children, Philadelphia
252 [illegible]
253. U. S. Army Hospital, Fort Dix, N. J.
254. St. Francis Hospital, Pittsburgh
255. Veterans Administration Hospital, Sioux Falls, S D.
256. Yankton State Hospital, Yankton, S. D.
257. T. C. Thompson Children's Hospital, Chattanooga, Tenn
258. University of Tennessee Memorial Hospital, East Tennessee Children's Hospital, Knoxville, Tenn.
259. Nashville General Hospital, Vanderbilt University Hospital, Tennessee State Penitentiary Hospital, Nashville, Tenn
260. Driscoll Foundation Children's Hospital, Corpus Christi, Texas
261. Children's Medical Center, Dallas, Texas
262. Parkland Memorial Hospital, Dallas, Texas
263. St. Luke's Hospital, Texas Children's Hospital, Houston, Texas
264. Jefferson Davis Hospital, Texas Children's Hospital, Houston, Texas
265. Crippled Children's Hospital, Waco, Texas
266. Children's Medical Center, Parkland Memorial Hospital, Dallas, Texas
267. Philadelphia State Hospital, Philadelphia
268. Children's Hospital, Philadelphia
269. Presbyterian Hospital, Elizabeth Steel Magee Hospital, Eye and Ear Hospital, Woman's Hospital, Children's Hospital, Western Psychiatric Institute and Clinic, Pittsburgh
270. Providence Lying-In Hospital, Providence, R. I.
271. University of Tennessee Memorial Research Center and Hospital, East Tennessee Tuberculosis Hospital, Knoxville, Tenn
272. West Tennessee Tuberculosis Hospital, Memphis Eye Ear Nose and Throat Hospital, City of Memphis Hospitals (John Gaston Hospital), Memphis
273. Veterans Administration Hospital, Salt Lake City
274. Salt Lake County General Hospital, Salt Lake City
275. Blue Ridge Sanatorium, Charlottesville, Va.; Kings Daughters Hospital, Staunton, Va.; Lynchburg General Hospital, Lynchburg, Va.
276. University of Virginia Hospital, Charlottesville, Va
277. Medical College of Virginia Hospital Division, Tucker Hospital, [illegible] ia Hospital Division, Richmond, Va.
278. [illegible] rtsmouth, Va.
279. [illegible] Hospital, Ogden, Utah; Salt Lake
280. [illegible] Lake City
Cou[illegible]
281. Primary Children's Hospital, Salt Lake City

282. Children's Orthopedic Hospital, Seattle
283. Ohio Valley General Hospital, Wheeling, W. Va.
284. Fort Lawton Station Hospital, Fort Lawton, Wash.; Fort Defiance Indian Hospital, Fort Defiance, Ariz.
285. Mountain View Sanatorium, Tacoma, Wash.
286. Mary Bridge Children's Hospital, Tacoma, Wash.
287. Milwaukee Children's Hospital, Milwaukee
288. Milwaukee Children's Hospital, Martha Washington Home, Milwaukee
289. Johnston's Emergency Hospital, Milwaukee Children's Hospital, Milwaukee
290. St. Michael Hospital, County Emergency Hospital, Milwaukee
291. Milwaukee Children's Hospital, Milwaukee County Emergency Hospital, Milwaukee
292. Milwaukee Children's Hospital, Milwaukee Contagion Hospital, Milwaukee
293. Milwaukee Hospital, Milwaukee
294. Milwaukee Children's Hospital, Milwaukee County Hospital, Milwaukee General Hospital, Milwaukee
295. St. Francis Hospital, Honolulu, Hawaii
296. Kings County Hospital, Brooklyn
297. Fort Hamilton Hospital, Hamilton, Ohio
298. Georgetown University Hospital, Buffalo
299. Veterans Administration Hospital, Hartford, Conn.
300. Sedgwick County Hospital, Wichita, Kan.
301. Veterans [illegible] y
302. Stanford [illegible] icisco
303. Universit[illegible]
304. Mississip[illegible] Miss.
305. Rio Pied[illegible] Hospital, Rio Piedras, P. R.
306. Baptist Hospital, Nashville, Tenn.
307. Veterans Administration Hospital, Little Rock, Ark.

APPROVED INTERNSHIPS BY TYPE OF SERVICE

ROTATING GENERAL

Number of Approved Programs, 809

FEDERAL

UNITED STATES ARMY

Letterman Army Hospital	San Francisco
Fitzsimons Army Hospital	Denver
Walter Reed Army Hospital (Army Medical Center)	Washington, D. C.
U. S. Army Hospital	Fort Benning, Ga.
U. S. Army Hospital	Fort Bragg, N. C.
Valley Forge Army Hospital	Phoenixville, Pa.
William Beaumont Army Hospital	El Paso, Texas
Brooke Army Hospital, Fort Sam Houston	San Antonio, Texas
Madigan Army Hospital	Tacoma, Wash.
Tripler Army Hospital	Honolulu, T. H.

UNITED STATES AIR FORCE

U. S. Air Force Hospital	San Antonio, Texas

UNITED STATES NAVY

U. S. Naval Hospital	Oakland, Calif.
U. S. Naval Hospital	Oceanside, Calif.
U. S. Naval Hospital	San Diego, Calif.
U. S. Naval [illegible]	acksonville, Fla.
U. S. Naval [illegible]	Pensacola, Fla.
U. S. Naval Hospital	Great Lakes, Ill.
U. S. Naval Hospital	Bethesda, Md.
U. S. Naval Hospital	Chelsea, Mass.
U. S. Naval Hospital	St. Albans, N. Y.
U. S. Naval Hospital	Philadelphia
U. S. Naval Hospital	Newport, R. I.
U. S. Naval Hospital	Charleston, S. C.
U. S. Naval Hospital	Portsmouth, Va.
U. S. Naval Hospital	Bremerton, Wash.

UNITED STATES PUBLIC HEALTH SERVICE

U. S. Public Health Service Hospital	San Francisco
U. S. Public Health Service Hospital	New Orleans
U. S. Public Health Service Hospital	Baltimore
U. S. Public Health Service Hospital	Boston
U. S. Public Health Service Hospital	Staten Island, N. Y.
U. S. Public Health Service Hospital	Norfolk, Va.
U. S. Public Health Service Hospital	Seattle, Wash.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Freedmen's Hospital	Washington, D. C.
Saint Elizabeths Hospital	Washington, D. C.

VETERANS ADMINISTRATION

Veterans Admin. Hospital	Los Angeles
Veterans Admin. Hospital	Salt Lake City

NONFEDERAL

Birmingham Baptist Hospitals	Birmingham, Ala.
Carraway Methodist Hospital	Birmingham, Ala.
St. Vincent's Hospital	Birmingham, Ala.
University Hospital and Hillman Clinic	Birmingham, Ala.
Lloyd Noland Hospital	Fairfield, Ala.
Holy Name of Jesus Hospital	Gadsden, Ala.
Mobile County Hospital	Mobile, Ala.
Druid City Hospital	Tuscaloosa, Ala.
Good Samaritan Hospital	Phoenix, Ariz.
Maricopa County General Hospital	Phoenix, Ariz.

NONFEDERAL—Continued

St. Joseph's Hospital	Phoenix, Ariz.
St. Mary's Hospital	Tucson, Ariz.
Tucson Medical Center	Tucson, Ariz.
Arkansas Baptist Hospital	Little Rock, Ark.
St. Vincent Infirmary	Little Rock, Ark.
University Hospital	Little Rock, Ark.
General Hospital of Riverside County	Arlington, Calif.
Herrick Memorial Hospital	Berkeley, Calif.
San Joaquin General Hospital	French Camp, Calif.
General Hospital of Fresno County	Fresno, Calif.
Glendale Sanitarium and Hospital	Glendale, Calif.
Loma Linda Sanitarium and Hospital	Loma Linda, Calif.
St. Mary's Long Beach Hospital	Long Beach, Calif.
Seaside Memorial Hospital	Long Beach, Calif.
California Hospital	Los Angeles
Cedars of Lebanon Hospital	Los Angeles
Hospital of the Good Samaritan	Los Angeles
Los Angeles County Hospital	Los Angeles
Presbyterian Hospital-Olmsted Memorial	Los Angeles
Queen of Angels Hospital	Los Angeles
St. Vincent's Hospital	Los Angeles
Santa Fe Coast Lines Hospital	Los Angeles
White Memorial Hospital	Los Angeles
[illegible]	Oakland, Calif.
[illegible]	Orange, Calif.
[illegible]	Pasadena, Calif.
Sacramento County Hospital	Sacramento, Calif.
San Bernardino County Charity Hospital	San Bernardino, Calif.
Mercy Hospital	San Diego, Calif.
San Diego County General Hospital	San Diego, Calif.
Children's Hospital	San Francisco
Franklin Hospital	San Francisco
French Hospital	San Francisco
Kaiser Foundation Hospital	San Francisco
Mary's Help Hospital	San Francisco
Mount Zion Hospital	San Francisco
St. Joseph's Hospital	San Francisco
St. Luke's Hospital	San Francisco
St. Mary's Hospital	San Francisco
San Francisco Hospital	San Francisco
Southern Pacific General Hospital	San Francisco
University of California Hospitals	San Francisco
Santa Clara County Hospital	San Jose, Calif.
Santa Barbara Cottage Hospital	Santa Barbara, Calif.
Santa Monica Hospital	Santa Monica, Calif.
Harbor General Hospital	Torrance, Calif.
Glockner-Penrose Hospital	Colorado Springs, Colo.
General Rose Memorial Hospital	Denver
Mercy Hospital	Denver
Porter Sanitarium and Hospital	Denver
Presbyterian Hospital	Denver
St. Anthony Hospital	Denver
St. Joseph's Hospital	Denver
St. Luke's Hospital	Denver
University of Colorado Medical Center	
Colorado General Hospital	Denver
Denver General Hospital	Denver
Weld County General Hospital	Greeley, Colo.
St. Mary-Corwin Hospital	Pueblo, Colo.
Bridgeport Hospital	Bridgeport, Conn.
St. Vincent's Hospital	Bridgeport, Conn.
Bristol Hospital	Bristol, Conn.
Danbury Hospital	Danbury, Conn.
Griffin Hospital	Derby, Conn.
Greenwich Hospital	Greenwich, Conn.
Hartford Hospital	Hartford, Conn.
Hartford Municipal Hospital and Health Center	Hartford, Conn.
Mount Sinai Hospital	Hartford, Conn.
St. Francis Hospital	Hartford, Conn.
Manchester Memorial Hospital	Manchester, Conn.
Meriden Hospital	Meriden, Conn.
Middlesex Memorial Hospital	Middletown, Conn.
New Britain General Hospital	New Britain, Conn.

NONFEDERAL—Continued

Hospital of St. Raphael	New Haven, Conn.
Lawrence and Memorial Hospitals	New London, Conn.
Norwalk Hospital	Norwalk, Conn.
Stamford Hospital	Stamford, Conn.
St. Mary's [illegible]	Waterbury, Conn.
Waterbury [illegible]	Waterbury, Conn.
Delaware Hospital	Wilmington, Del.
Memorial Hospital	Wilmington, Del.
Wilmington General Hospital	Wilmington, Del.
District of Columbia General Hospital	Washington, D. C.
Doctors Hospital	Washington, D. C.
Providence Hospital	Washington, D. C.
Sibley Memorial Hospital	Washington, D. C
Washington Hospital Center	Washington, D. C.
Washington Sanitarium and Hospital	Washington, D. C.
Baptist Memorial Hospital	Jacksonville, Fla.
Duval Medical Center	Jacksonville, Fla.
St. Luke's Hospital	Jacksonville, Fla.
St. Vincent's Hospital	Jacksonville, Fla.
Jackson Memorial [illegible]	Miami, Fla.
Mount Sinai Hospital [illegible]	Beach, Fla.
St. Francis Hospital	Miami Beach, Fla.
Orange Memorial Hospital	Orlando, Fla.
Sacred Heart Hospital	Pensacola, Fla.
Mound Park Hospital	St. Petersburg, Fla.
Tampa General Hospital	Tampa, Fla.
Good Samaritan Hospital	West Palm Beach, Fla.
St. Mary's Hospital	West Palm Beach, Fla.
Athens General Hospital	Athens, Ga.
St. Mary's Hospital	Athens, Ga.
Crawford W. Long Memorial Hospital	Atlanta, Ga.
Georgia Baptist Hospital	Atlanta, Ga.
Grady Memorial Hospital	Atlanta, Ga.
Piedmont Hospital	Atlanta, Ga.
St. Joseph's Infirmary	Atlanta, Ga.
University Hospital	Augusta, Ga.
Medical Center	Columbus, Ga.
Macon Hospital	Macon, Ga.
Kennestone Hospital	Marietta, Ga.
Floyd Hospital	Rome, Ga.
Memorial Hospital of Chatham County	Savannah, Ga.
MacNeal Memorial Hospital	Berwyn, Ill.
St. Francis Hospital	Blue Island, Ill.
American Hospital	Chicago
Augustana Hospital	Chicago
Chicago Wesley Memorial Hospital	Chicago
Columbus Hospital	Chicago
Cook County Hospital	Chicago
Edgewater Hospital	Chicago
[illegible] Hospital	Chicago
[illegible]	Chicago
[illegible]	Chicago
[illegible] Padua	Chicago
Illinois Central Hospital	Chicago
Illinois Masonic Hospital	Chicago
Jackson Park Hospital	Chicago
Loretto Hospital	Chicago
Lutheran Deaconess Home and Hospital	Chicago
[illegible]	Chicago
[illegible]	Chicago
[illegible]	Chicago
Norwegian-American Hospital	Chicago
Passavant Memorial Hospital	Chicago
Presbyterian-St. Luke's Hosp., Presbyterian Hosp. Division	Chicago
Provident Hospital	Chicago
Ravenswood Hospital	Chicago
Resurrection Hospital	Chicago
St. Anne's Hospital	Chicago
St. Bernard's Hospital	Chicago
[illegible]	Chicago
[illegible]	Chicago
[illegible] Hosp., St. Luke's Hosp. Division	Chicago
St. Mary of Nazareth Hospital	Chicago
South Chicago Community Hospital	Chicago
South Shore Hospital	Chicago
Swedish Covenant Hospital	Chicago
University of Chicago Clinics	Chicago
University of Illinois Research and Educational Hospitals	Chicago
Woodlawn Hospital	Decatur, Ill.
Decatur and Macon County Hospital	East St. Louis, Ill.
St. Mary's [illegible]	Elmhurst, Ill.
Memorial [illegible] County	Evanston, Ill.
Evanston [illegible]	Evanston, Ill.
St. Francis Hospital	Evergreen Park, Ill.
Little Company of Mary Hospital	Hinsdale, Ill.
Hinsdale Sanitarium and Hospital	Oak Park, Ill.
Oak Park Hospital	Oak Park, Ill.
West Subr[illegible]	Peoria, Ill.
Methodist [illegible] nois	Peoria, Ill.
St. Franci[illegible]	Rockford, Ill.
Rockford [illegible]	Rockford, Ill.
St. Anthony Hospital	Rockford, Ill.
Swedish-American Hospital	East Chicago, Ind.
St. Catherine Hospital	Evansville, Ind.
St. Mary's Hospital	Fort Wayne, Ind.
Lutheran Hospital	Fort Wayne, Ind.
St. Joseph's Hospital	Gary, Ind.
Methodist Hospital	Gary, Ind.
St. Mary Mercy Hospital	Hammond, Ind.
St. Margaret Hospital	Indianapolis
Indianapolis General Hospital	Indianapolis
Indiana University Medical Center	Indianapolis
Methodist [illegible]	Indianapolis
St. Vince[illegible]	Muncie, Ind.
[illegible]	South Bend, Ind.
[illegible]	South Bend, Ind.
St. Jo[illegible]	

NONFEDERAL—Continued

Mercy Hospital	
St. Luk[illegible]	South Bend, Ind.
Mercy [illegible]	Cedar Rapids, Iowa
Broadl[illegible]	Council Bluffs, Iowa
Iowa [illegible]	Des Moines, Iowa
Iowa M[illegible]	Des Moines, Iowa
Mercy Hospital	Des Moines, Iowa
State [illegible]	Des Moines, Iowa
Betha[illegible]	Iowa City
St. M[illegible]	City, Kan.
	City, Kan.
University of Kansas Medical Center	Kansas City, Kan.
St. Francis Hospital	Wichita, Kan.
Wesley Hospital	Wichita, Kan.
Wichita-St. Joseph Hospital	Wichita, Kan.
St. Elizabeth Hospital	Covington, Ky.
Good Samaritan Hospital	Lexington, Ky.
St. Joseph Hospital	Lexington, Ky.
Louisville General Hospital	Louisville, Ky.
St. Anthony Hospital	Louisville, Ky.
St. Joseph Infirmary	Louisville, Ky.
SS. Mary and Elizabeth Hospital	Louisville, Ky.
Charity Hospital of Louisiana	New Orleans
Hotel Dieu	New Orleans
Mercy Hospital	New Orleans
Southern Baptist Hospital	New Orleans
Touro Infirmary	New Orleans
Confederate Memorial [illegible]	La.
North Louisiana Sanita[illegible]	La.
T. E. Schumpert Memorial Sanitarium	Shreveport, La.
Eastern Maine General Hospital	Bangor, Maine
Central Maine General Hospital	Lewiston, Maine
St. Mary's General Hospital	Lewiston, Maine
Maine Medical Center	Portland, Maine
Baltimore City Hospitals	Baltimore
Bon Secours Hospital	Baltimore
Church Home and Hospital	Baltimore
Franklin Square Hospital	Baltimore
Lutheran Hospital	Baltimore
Maryland General Hospital	Baltimore
Mercy Hospital	Baltimore
Provident Hospital and Free Dispensary	Baltimore
St. Agnes Hospital	Baltimore
St. Joseph's Hospital	Baltimore
[illegible]	Baltimore
[illegible]	Baltimore
[illegible]	Baltimore
[illegible]	Baltimore
[illegible]	Bethesda, Md.
[illegible]	Cheverly, Md.
[illegible]	Hagerstown, Md.
Beverly [illegible]	Beverly, Mass.
Carney [illegible]	Boston
New En[illegible]	Boston
[illegible]	Boston
[illegible]	Brockton, Mass.
[illegible]	Cambridge, Mass.
Mount Auburn Hospital	Cambridge, Mass.
Truesdale Hospital	Fall River, Mass.
Union [illegible]	Fall River, Mass.
Holyoke [illegible]	Holyoke, Mass.
Lawrence [illegible]	Lawrence, Mass.
Lowell [illegible]	Lowell, Mass.
St. Joh[illegible]	Lowell, Mass.
St. Joseph's Hospital	Lowell, Mass.
[illegible]	Lynn, Mass.
[illegible]	New Bedford, Mass.
[illegible]	Newton Lower Falls, Mass.
[illegible]	Pittsfield, Mass.
St. Luke's Hospital	Quincy, Mass.
Quincy City Hospital	Salem, Mass.
Salem Hospital	Springfield, Mass.
Mercy Hospital	Springfield, Mass.
Springfield Hospital	Springfield, Mass.
Wesson Memorial Hospital	Waltham, Mass.
Waltham Hospital	Worcester, Mass.
Memorial [illegible]	Worcester, Mass.
St. Vincen[illegible]	Worcester, Mass.
Worcester [illegible]	Ann Arbor, Mich.
St. Joseph[illegible]	Ann Arbor, Mich.
University Hospital	Battle Creek, Mich.
Leila Y. Post Montgomery Hospital	Benton Harbor, Mich.
Mercy [illegible]	Dearborn, Mich.
Oakwo[illegible]	Detroit
Detroit [illegible]	Detroit
[illegible]	Detroit
[illegible]	Detroit
[illegible]	Detroit
[illegible]	Detroit
Mount Carmel Mercy Hospital	Detroit
Providence Hospital	Detroit
Receiving Hospital	Detroit
St. John Hospital	Detroit
St. Joseph Mercy Hospital	Detroit
Sinai Hospital	Detroit
Woman's Hospital	Eloise, Mich.
Wayne County General Hospital and Infirmary	Flint, Mich.
Hurley Hospital	Flint, Mich.
McLaren General Hospital	Flint, Mich.
St. Joseph Hospital	Grand Rapids, Mich.
[illegible] Hospital	Grand Rapids, Mich.
[illegible]	Grand Rapids, Mich.
[illegible]	Grosse Pointe, Mich.
Bon Secours [illegible]	Highland Park, Mich.
Highland P[illegible]	Kalamazoo, Mich.
Borgess [illegible]	Kalamazoo, Mich.
Bronson [illegible]	Lansing, Mich.
Edward [illegible]	Lansing, Mich.
St. Lawrence Hospital	

NONFEDERAL—Continued

Midland Hospital	Midland, Mich.
Pontiac General Hospital	Pontiac, Mich.
St. Joseph Mercy Hospital	Pontiac, Mich.
William Beaumont Hospital	Royal Oak, Mich.
Saginaw General Hospital	Saginaw, Mich.
St. Luke's Hospital	Saginaw, Mich.
St. Mary's Hospital	Saginaw, Mich.
James Decker Munson Hospital	Traverse City, Mich.
St. Luke's Hospital	Duluth, Minn.
St. Mary's Hospital	Duluth, Minn.
Asbury Methodist Hospital	Minneapolis
Minneapolis General Hospital	Minneapolis
Mount Sinai Hospital	Minneapolis
Northwestern Hospital	Minneapolis
St. Barnabas Hospital	Minneapolis
St. Mary's Hospital	Minneapolis
Swedish Hospital	Minneapolis
University of Minnesota Hospitals	Minneapolis
Ancker Hospital	St. Paul
Bethesda Hospital	St. Paul
Charles T. Miller Hospital	St. Paul
St. Joseph's Hospital	St. Paul
St. Luke's Hospital	St. Paul
Mississippi Baptist Hospital	Jackson, Miss.
University [illegible]	Jackson, Miss.
St. Louis [illegible]	Clayton, Mo.
Kansas Cit [illegible]	[illegible] nsas City, Mo.
Kansas City General Hospital No. 2	Kansas City, Mo.
Menorah Medical Center	Kansas City, Mo
Research Hospital	Kansas City, Mo.
St. Joseph Hospital	Kansas City, Mo.
St. Luke's Hospital	Kansas City, Mo.
St. Mary's Hospital	Kansas City, Mo.
Trinity Lutheran Hospital	Kansas City, Mo.
Missouri Methodist Hospital	St. Joseph, Mo.
St. Joseph's Hospital	St. Joseph, Mo.
Christian Hospital	St. Louis
De Paul Hospital	St. Louis
Evangelical Deaconess Hospital	St. Louis
Homer G. Phillips Hospital	St. Louis
Jewish Hospital	St. Louis
Missouri Baptist Hospital	St. Louis
St. Anthony's Hospital	St. Louis
St. John's Hospital	St. Louis
St. Louis City Hospital	St. Louis
St. Luke's Hospital	St. Louis
St. Mary's Group of Hospitals	St. Louis
St. James Hospital	Butte, Mont.
Montana Deaconess Hospital	Great Falls, Mont.
Bryan Memorial Hospital	Lincoln, Neb.
Lincoln General Hospital	Lincoln, Neb.
St. Elizabeth Hospital	Lincoln, Neb.
Bishop Clarkson Memorial Hospital	Omaha
Creighton Memorial St. Joseph's Hospital	Omaha
Immanuel Hospital	Omaha
Nebraska Methodist Hospital	Omaha
St. Catherine's Hospital	Omaha
University of Nebraska Hospital	Omaha
Mary Hitchcock Memorial Hospital	Hanover, N. H.
Atlantic City Hospital	Atlantic City, N. J.
Bayonne Hospital and Dispensary	Bayonne, N. J.
Cooper Hospital	Camden, N. J.
Our Lady of Lourdes Hospital	Camden, N. J.
West Jersey Hospital	Camden, N. J.
East Orange General Hospital	East Orange, N. J.
Alexian Brothers Hospital	Elizabeth, N. J.
Elizabeth General Hospital and Dispensary	Elizabeth, N. J.
St. Elizabeth Hospital	Elizabeth, N. J.
Englewood Hospital	Englewood, N. J.
Hackensack Hospital	Hackensack, N. J
St. Mary's Hospital	Hoboken, N. J.
Christ Hospital	Jersey City, N. J.
Jersey City Hospital	Jersey City, N. J.
St. Francis Hospital	Jersey City, N. J.
Monmouth Memorial Hospital	Long Branch, N. J.
Mountainside Hospital	Montclair, N. J.
Morristown Memorial Hospital	Morristown, N. J.
Fitkin Memorial Hospital	Neptune, N. J.
Harrison S. Martland Medical Center	Newark, N. J.
Newark Beth Israel Hospital	Newark, N. J.
Presbyterian Hospital	Newark, N. J.
St. Barnabas Medical Center	Newark, N. J.
St. Michael's Hospital	Newark, N. J.
Middlesex General Hospital	New Burnswick, N. J.
St. Peter's General Hospital	New Brunswick, N. J.
Orange Memorial Hospital	Orange, N. J.
Bergen Pines County Hospital	Paramus, N. J.
Passaic General Hospital	Passaic, N. J.
St. Mary's Hospital	Passaic, N. J.
Nathan and Miriam Barnert Memorial Hospital	Paterson, N. J.
Paterson General Hospital	Paterson, N. J.
St. Joseph Hospital	Paterson, N. J.
Perth Amboy General Hospital	Perth Amboy, N. J.
Muhlenberg Hospital	Plainfield, N. J.
Somerset Hospital	Somersville, N. J.
Overlook Hospital	Summit, N. J.
Holy Name Hospital	Teaneck, N. J.
Mercer Hospital	Trenton, N. J.
St. Francis Hospital	Trenton, N. J.
William McKinley Memorial Hospital	Trenton, N. J.
Bernalillo County Indian Hospital	Albuquerque, N. M.
Albany Hospital	Albany, N. Y.
Memorial Hospital	Albany, N. Y.
St. Peter's Hospital	Albany, N. Y.
Binghamton City Hospital	Binghamton, N. Y.
Lawrence Hospital	Bronxville, N. Y.

NONFEDERAL—Continued

Beth-El Hospital	Brooklyn
Brooklyn Hospital	Brooklyn
Coney Island Hospital	Brooklyn
Cumberland Hospital	Brooklyn
Greenpoint Hospital	Brooklyn
Jewish Hospital	Brooklyn
Kings County Hospital	Brooklyn
Long Island College Hospital	Brooklyn
Luthern Hospital	Brooklyn
Lutheran Medical Center	Brooklyn
Maimonides Hospital	Brooklyn
Methodist Hospital	Brooklyn
Prospect Heights Hospital	Brooklyn
St. Catherine's Hospital	Brooklyn
St. John's Episcopal Hospital	Brooklyn
St. Mary's Hospital	Brooklyn
St. Peter's Hospital	Brooklyn
Unity Hospital	Brooklyn
Wyckoff Heights Hospital	Brooklyn
Sisters of Charity Hospitals	Buffalo
Buffalo General Hospital	Buffalo
Deaconess Hospital	Buffalo
Edward J. Meyer Memorial Hospital	Buffalo
Mercy Hospital	Buffalo
Millard Fillmore Hospital	Buffalo
Mary Imogene Bassett Hospital	Cooperstown, N. Y.
Elmhurst General Hospital	Elmhurst, N. Y.
Arnot Ogden Memorial Hospital	Elmira, N. Y.
St. Joseph's Hospital	Elmira, N. Y.
Flushing Hospital and Dispensary	Flushing, N. Y.
Community Hospital	Glen Cove, N. Y.
Glens Falls Hospital	Glens Falls, N. Y.
Meadowbrook Hospital	Hempstead, N. Y.
Mary Immaculate Hospital	Jamaica, N. Y.
Queens General Hospital Center	Jamaica, N. Y.
Charles S. Wilson Memorial Hospital	Johnson City, N. Y.
Our Lady of Victory Hospital	Lackawanna, N. Y.
St. John's Long Island City Hospital	Long Island City, N. Y.
Nassau [illegible]	[illegible] ineola, N. Y.
Northern [illegible]	[illegible] Kisco, N. Y.
Mount V [illegible]	[illegible] ernon, N. Y.
St. Luke's Hospital	Newburgh, N. Y.
Long Island Jewish Hospital	New Hyde Park, N. Y.
New Rochelle Hospital	New Rochelle, N. Y.
Beth David Hospital	New York City
Beth Israel Hospital	New York City
Bronx Hospital	New York City
Columbus Hospital	New York City
Fordham Hospital	New York City
French Hospital	New York City
Harlem Hospital	New York City
Hospital for Joint Diseases	New York City
Jewish Memorial Hospital	New York City
Knickerbocker Hospital	New York City
Lebanon Hospital	New York City
Lenox Hill Hospital	New York City
Lincoln Hospital	New York City
Misericordia Hospital	New York City
Morrisania City Hospital	New York City
Mother Cabrini Memorial Hospital	New York City
Mount Sinai Hospital	New York City
New York Infirmary	New York City
New York Polyclinic Medical School and Hospital	New York City
St. Clare's Hospital	New York City
St. Francis Hospital	New York City
St. Vincent's Hospital	New York City
Sydenham Hospital	New York City
Mount St. Mary's Hospital	Niagara Falls, N. Y.
Niagara Falls Memorial Hospital	Niagara Falls, N. Y.
United Hospital	Port Chester, N. Y.
Vassar Brothers Hospital	Poughkeepsie, N. Y.
Genesee Hospital	Rochester, N. Y.
Highland Hospital	Rochester, N. Y.
Rochester General Hospital	Rochester, N. Y.
St. Mary's Hospital	Rochester, N. Y.
Strong Memorial-Rochester Municipal Hospital	Rochester, N. Y.
Ellis Hospital	Schenectady, N. Y.
St. Clare's Hospital	Schenectady, N. Y.
St. Vincent's Hospital	Staten Island, N. Y.
Staten Island Hospital	Staten Island, N. Y.
St. Joseph's Hospital	Syracuse, N. Y.
State University of New York Upstate Medical Center	Syracuse, N. Y.
Leonard Hospital	Troy, N. Y.
St. Mary Hospital	Troy, N. Y.
Samaritan Hospital	Troy, N. Y.
White Plains Hospital	White Plains, N. Y.
St. John's Riverside Hospital	Yonkers, N. Y.
St. Joseph's Hospital	Yonkers N. Y.
Yonkers General Hospital	Yonkers, N. Y.
Memorial Mission Hospital of Western North Carolina	Asheville, N. C.
Charlotte Memorial Hospital	Charlotte, N. C.
Watts Hospital	Durham, N. C.
Moses H. Cone Memorial Hospital	Greensboro, N. C.
Rex [illegible]	[illegible] N. C.
City [illegible]	[illegible] N. C.
Kate [illegible]	[illegible] N. C.
St. John's Hospital	Fargo, N. D.
St. Luke's Hospital	Fargo, N. D.
Grand Forks Deaconess Hospital	Grand Forks, N. D.
Akron City Hospital	Akron, Ohio
Akron General Hospital	Akron, Ohio
St. Thomas Hospital	Akron, Ohio
Barberton Citizens Hospital	Barberton, Ohio
Aultman Hospital	Canton, Ohio
Mercy Hospital	Canton, Ohio
Bethesda Hospital	Cincinnati
Christ Hospital	Cincinnati

NONFEDERAL—Continued

Cincinnati General Hospital	Cincinnati
Good Samaritan Hospital	Cincinnati
Jewish Hospital	Cincinnati
St. Mary's [illegible]	Cincinnati
Cleveland [illegible]	Cleveland
Cuyahoga [illegible]	Cleveland
Evangelical [illegible]	Cleveland
Fairview P[illegible]	Cleveland
Huron Road Hospital	Cleveland
Lutheran Hospital	Cleveland
Mount Sinai Hospital	Cleveland
St. Alexis [illegible]	Cleveland
St. John's [illegible]	Cleveland
St. Luke's [illegible]	Cleveland
St. Vincent Charity Hospital	Cleveland
University Hospitals	Cleveland
Grant [illegible]	Columbus, Ohio
Mount [illegible]	Columbus, Ohio
Univers[illegible]	Columbus, Ohio
White Cross Hospital	Columbus, Ohio
Good S[illegible]	Dayton, Ohio
Miami [illegible]	Dayton, Ohio
St. Eli[illegible]	Dayton, Ohio
Elyria M[illegible] Hospital	Elyria, Ohio
Euclid-Glenville Hospital	Euclid, Ohio
Marymount Hospital	Garfield Heights, Ohio
Mercy Hospital	Hamilton, Ohio
Lakewood [illegible]	[illegible]ewood, Ohio
Lima Mem[illegible]	Lima, Ohio
St. [illegible]	Lima, Ohio
St. [illegible]	Lorain, Ohio
Merc[illegible]	Springfield, Ohio
Springfield City Hospital	Springfield, Ohio
Ohio Valley Hospital	Steubenville, Ohio
Flower [illegible]	Toledo, Ohio
Maumee [illegible]	Toledo, Ohio
Mercy Hospital	Toledo, Ohio
Riverside Hospital	Toledo, Ohio
St. Charles [illegible]	Toledo, Ohio
St. Vincent's [illegible]	Toledo, Ohio
Toledo Hospital	Warren, Ohio
Trumbull Memorial Hospital	Youngstown, Ohio
St. Elizabeth Hospital	[illegible]oungstown, Ohio
Youngstown H[illegible]	Zanesville, Ohio
Good Samarit[illegible]	Oklahoma City
Mercy Hospit[illegible]	Oklahoma City
St. Anthony Hospital	Oklahoma City
University of Oklahoma Hospitals	Oklahoma City
Wesley [illegible]	Tulsa, Okla.
Hillcrest [illegible]	Tulsa, Okla.
St. John's Hospital	Eugene, Ore.
Sacred Heart General Hospital	Portland, Ore.
Emanuel [illegible]	Portland, Ore.
Good Sa[illegible]	Portland, Ore.
Portland S[illegible]	Portland, Ore.
Providence Hospital	Portland, Ore.
St. Vincent's Hospital	
University of Oregon Medical School Hospitals	Portland, Ore.
and Clinics	Abington, Pa.
Abington Memorial Hospital	Allentown, Pa.
[illegible] Hospital	Allentown, Pa.
[illegible]	Altoona, Pa.
[illegible]	Altoona, Pa.
[illegible]	Bethlehem, Pa.
[illegible]	Bristol, Pa.
Lower Bucks County Hospital	Bryn Mawr, Pa.
Bryn Mawr Hospital	Butler, Pa.
Butler County Memorial Hospital	Chester, Pa.
Chester Hospital	Danville, Pa.
George F. Geisinger Memorial Hospital	Darby, Pa.
Thomas M. Fitzgerald-Mercy Hospital	Easton, Pa.
Easton Hospital	Erie, Pa.
Hamot Hospital	Erie, Pa.
St. Vincent's Hospital	Greensburg, Pa.
Westmoreland Hospital	Harrisburg, Pa.
Harrisburg Hospital	Harrisburg, Pa.
Harrisburg Polyclinic Hospital	Johnstown, Pa.
Conemaugh Valley Memorial Hospital	Kingston, Pa.
Nesbitt Memorial Hospital	Lancaster, Pa.
Lancaster General Hospital	Lancaster, Pa.
St. Joseph's Hospital	McKeesport, Pa.
McKeesport Hospital	Norristown, Pa.
Montgomery Hospital	Norristown, Pa.
Sacred Heart Hospital	Philadelphia
Albert Einstein Medical Center, Northern Division	Philadelphia
Albert Einstein Medical Center, Southern Division	Philadelphia
Chestnut Hill Hospital	Philadelphia
Episcopal Hospital	Philadelphia
Frankford Hospital	Philadelphia
Germantown Dispensary and Hospital	Philadelphia
Graduate Hospital of the University of Pennsylvania	Philadelphia
Hahnemann Medical College and Hospital	Philadelphia
Hospital of the University of Pennsylvania	Philadelphia
Hospital of the Woman's Medical College of Pennsylvania	Philadelphia
Jefferson Medical College Hospital	Philadelphia
Lankenau Hospital	Philadelphia
[illegible]	Philadelphia
[illegible]	Philadelphia
[illegible]	Philadelphia
Methodist Episcop[illegible]	
Misericordia Hospital	Philadelphia
Nazareth Hospital	Philadelphia
Northeastern Hospital	Philadelphia
Pennsylvania Hospital	Philadelphia
[illegible] General Hospital	Philadelphia
[illegible]	Philadelphia
[illegible]	Philadelphia
St. Joseph's Hospital	

NONFEDERAL—Continued

St. Mary's [illegible]	Philadelphia
Allegheny [illegible]	Pittsburgh
Health Cen[illegible]	
Pittsburg[illegible] of Medicine	Pittsburgh
Mercy [illegible]	Pittsburgh
Montefi[illegible]	Pittsburgh
Pittsbu[illegible]	Pittsburgh
St. Francis [illegible]	Pittsburgh
St. John's G[illegible]	Pittsburgh
St. Joseph's Hospit[illegible]	[illegible]urgh
St. Margare[illegible]	[illegible]urgh
Shadyside [illegible]	[illegible]urgh
South Side [illegible]	[illegible]urgh
Western Pe[illegible]	[illegible]urgh
Community [illegible]	[illegible] Pa.
Reading [illegible]	[illegible]eading, Pa.
St. Josep[illegible]	[illegible]eading, Pa.
Robert P[illegible]	Sayre, Pa.
Scranton [illegible]	[illegible]ranton, Pa.
Sewickley [illegible]	[illegible]ickley, Pa.
Allegheny [illegible]	[illegible]entum, Pa.
Uniontow[illegible]	Uniontown, Pa.
Washington [illegible]	Washington, Pa.
Chester Cou[illegible]	[illegible]est Chester, Pa.
Mercy Hosp[illegible]	Wilkes-Barre, Pa.
[illegible]	Wilkes-Barre, Pa.
[illegible]	Wilkinsburg, Pa.
Williamspo[illegible]	W[illegible]t, Pa.
York [illegible]	[illegible]k, Pa.
Newpo[illegible]	[illegible] R. I.
Mem[illegible]	[illegible] R. I.
[illegible]	[illegible], R. I.
[illegible]	Providence, R. I.
[illegible]	Providence, R. I.
[illegible] Hospital	Providence, R. I.
Medical College of South Carolina Teaching Hospitals	Charleston, S. C.
Columbia Hospital of Richland County	Columbia, S. C.
McLeod Infirmary	Florence, S. C.
Greenville General Hosp[illegible]	Greenville, S. C.
Orangeburg Region[illegible]	[illegible]rangeburg, S. C.
Spartanburg Gener[illegible]	[illegible]artanburg, S. C.
McKennan H[illegible]	[illegible]ioux Falls, S. D.
Sioux Valley [illegible]	[illegible]ioux Falls, S. D.
Sacred Hea[illegible]	Yankton, S. D.
Baroness E[illegible]	[illegible]ttanooga, Tenn.
Holston Va[illegible]	[illegible]ingsport, Tenn.
East Tennessee Bapt[illegible]	Knoxville, Tenn.
St. Mary's Memorial [illegible]	Knoxville, Tenn.
University of Tenness[illegible]	Knoxville, Tenn.
and Hosp[illegible]	Memphis, Tenn.
Baptist [illegible]	Memphis, Tenn.
City o[illegible]	Memphis, Tenn.
Methodist Hospital	Memphis, Tenn.
St. Joseph Hospital	Nashville, Tenn.
Baptist [illegible]	Nashville, Tenn.
George [illegible]	Nashville, Tenn.
Nashvill[illegible]	Nashville, Tenn.
St. Tho[illegible]	Austin, Texas
Bracken[illegible]	[illegible] Christi, Texas
Memoria[illegible]	Dallas, Texas
Baylor University Hospital	Dallas, Texas
Methodist [illegible]	Dallas, Texas
Parkland [illegible]	Dallas, Texas
St. Paul's Hospital	El Paso, Texas
El Paso General Hospital	El Paso, Texas
Hotel Dieu Sisters' Hospital	Fort Worth, Texas
Harris Hospital	Fort Worth, Texas
John Peter Smith Hospital	Fort Worth, Texas
St. Joseph's Hospital	Galveston, Texas
University of Texas Medical Branch Hospitals	Houston, Texas
Hermann Hospital	Houston, Texas
Jefferson Davis Hospital	Houston, Texas
Memorial Hospital	Houston, Texas
Methodist [illegible]	Houston, Texas
St. Joseph's [illegible]	San Antonio, Texas
Baptist Me[illegible]	San Antonio, Texas
Robert B. G[illegible]	San Antonio, Texas
Santa Rosa Hospital	Temple, Texas
Scott and White Memorial Hospitals	Waco, Texas
Prov[illegible]	Ogden, Utah
St. [illegible] Hospital	Ogden, Utah
Tho[illegible]	Salt Lake City
Dr. W. H. Groves-Latter Day Saints Hospital	Salt Lake City
Holy Cross Hospital	Salt Lake City
St. Mark's Hospital	Salt Lake City
Salt Lake County General Hospital	Burlington, Vt.
DeGoesbriand Memorial Hospital	Burlington, Vt.
Mary Fletcher Hospital	Alexandria, Va.
Alexandria Hospital	Charlottesville, Va.
University of Virginia Hospital	Danville, Va.
	Newport News, Va.
Memor[illegible]	Newport News, Va.
Mary [illegible]	Norfolk, Va.
Riversi[illegible]	Norfolk, Va.
De Paul [illegible]	Petersburg, Va.
Norfolk [illegible]	Portsmouth, Va.
Petersbu[illegible]	Richmond, Va.
[illegible]	Richmond, Va.
[illegible] Hospital Division	Richmond, Va.
[illegible]	Richmond, Va.
[illegible]	Roanoke, Va.
[illegible]	Roanoke, Va.
[illegible]	Winchester, Va.
[illegible]	Seattle
[illegible]	Seattle
[illegible] 1 (Harborview)	
King County Hosp[illegible]	

NONFEDERAL—Continued

[illegible] Hospital	Seattle
	Seattle
	Seattle
	Seattle
	Wash
	Wash
St Luke's Hospital	Spokane, Wash
Pierce County Hospital	Tacoma, Wash
St Joseph Hospital	Tacoma, Wash
Tacoma General Hospital	Tacoma, Wash
Charleston General Hospital	Charleston, W Va
Kanawha Valley Hospital	Charleston, W Va
Memorial Hospital	Charleston, W Va
Cabell Huntington Hospital	Huntington, W Va
St Mary's Hospital	Huntington, W Va
Camden Clark Memorial Hospital	Parkersburg, W Va
St Joseph's Hospital	Parkersburg, W Va
Weirton General Hospital	Weirton, W Va
Ohio Valley General Hospital	Wheeling, W Va
Wheeling Hospital	Wheeling, W Va
Luther Hospital	Eau Claire, Wis
St Agnes Hospital	Fond du Lac, Wis
Mercy Hospital	Janesville, Wis
La Crosse Lutheran Hospital	La Crosse, Wis
St Francis Hospital	La Crosse Wis
Madison General Hospital	Madison, Wis
Methodist Hospital	Madison, Wis
St Mary's Hospital	Madison, Wis
University Hospital	Madison, Wis
St Joseph's Hospital	Marshfield, Wis
Columbia Hospital	Milwaukee
Evangelical Deaconess Hospital	Milwaukee
Milwaukee County Hospital	Milwaukee
Milwaukee Hospital	Milwaukee
Misericordia Hospital	Milwaukee
Mount Sinai Hospital	Milwaukee
St Joseph's Hospital	Milwaukee
St Luke's Hospital	Milwaukee
St Mary's Hospital	Milwaukee
St Michael Hospital	Milwaukee
St Mary's Hospital	Wausau Wis
Gorgas Hospital	Ancon Canal Zone
Kuakini Hospital	Honolulu T H
Queen's Hospital	Honolulu T H
St Francis Hospital	Honolulu T H
Aguadilla District Hospital	Aguadilla, P R
Arecibo District Hospital	Arecibo, P R
Bayamon Charity District Hospital	Bayamon, P R
Fajardo District Hospital	Fajardo, P R
Hospital de Damas	Ponce P R
Ponce District Hospital	Ponce, P R
Rio Piedras Municipal Hospital	Rio Piedras P R
Presbyterian Hospital	San Juan P R
San Juan City Hospital	San Juan P R

ROTATING (Med Major)

Number of Approved Programs, 6

George Washington University Hospital	Washington D C
Sinai Hospital	Baltimore
Missouri Baptist Hospital	St Louis
University of Oklahoma Hospitals	Oklahoma City
St Paul's Hospital	Dallas Texas
Norfolk General Hospital	Norfolk Va

ROTATING (Surg Major)

Number of Approved Programs, 7

George Washington University Hospital	Washington D C
Sinai Hospital	Baltimore
St Joseph	, Mo
Missouri	Louis
Universit	City
St Paul's Hospital	Dallas Texas
Norfolk General Hospital	Norfolk, Va

ROTATING (Ped. Major)

Number of Approved Programs, 3

Sinai Hospital	Baltimore
University of Oklahoma Hospitals	Oklahoma City
Norfolk General Hospital	Norfolk, Va

ROTATING (Ob-Gyn. Major)

Number of Approved Programs, 1

Norfolk General Hospital	Norfolk Va

OTHER ROTATING

Number of Approved Programs, 17

University of Colorado Medical Center	
Colorado General Hospital	Denver
Community Rotating	
Denver General Hospital	Denver
C	
sity Hospital	Washington, D C
Rotating (Path Major)	
University Hospital	Ann Arbor, Mich
Rotating (Med Major)	
Rotating (Sur Major)	
Rotating (Ped Major)	

OTHER ROTATING—Continued

Rotating (Ob Gyn Major)
Rotating (Neurol Major)
Rotating (Derm Major)
Rotating (Anes Major)
Rotating (Path Major)
Rotating (Otol Major)
Rotating (Ophthl Major)
Rotating (Gen Prac Major)
Rotating (Phys Med Rehab Major)

MIXED

Number of Approved Programs, 29

U S Public Health Service Hospital, Boston, Med Surg
Georgetown University Hospital, Washington, D C; Surg Med
University of Kansas Medical Center, Kansas City, Kan, Med Path, Med Surg Ped, Path Surg
Baltimore City Hospitals Baltimore, Med Ped
Hospital for Women, Baltimore Med Ob Gyn
University Hospital Baltimore Surg Ob Gyn
Holyoke Hospital Holyoke Mass, Med Surg
Jewish Hospital, St Louis, Med Surg Pul Neuro Neoplastic
Lutheran Hospital St Louis, Med Surg Ob Gyn
Bellevue Hospital Center, New York City
Division I—Medical—Columbia University, Med Chest Surg or Path
Bellevue Hospital Center, New York City
Division II—Medical—Cornell University, Med Path
Bellevue Hospital Center, New York City
Division III—Medical—New York University College of Medicine; Surg Med
Bellevue Hospital Center New York City
Division III—Surgical—New York University College of Medicine, Surg Med
Montefiore Hospital, New York City, Med Surg Pul Neuro Neoplastic
Roosevelt Hospital, New York City, Med Surg Ped Surg Gyn Med
St Luke's Hospital, New York City, Med Surg, Surg Med
Strong Memorial Rochester Municipal Hospital, Rochester, N Y, Surg Ob Gyn
General Hospital Syracuse, N Y, Med Surg Ob Gyn
State University of New York Upstate Medical Center, Syracuse N Y, Med Surg
Grasslands Hospital Valhalla N Y, Med Surg Ped Surg Med Ob
North Carolina Memorial Hospital, Chapel Hill N C, Med Ped
Duke Hospital, Durham, N C, Ob Ped
North Carolina Baptist Hospital, Winston Salem, N C, Med Ob Ped
Bethesda Hospital Cincinnati, Med Ob Surg
University of Oklahoma Hospitals, Oklahoma City Med Surg Ped
Baroness Erlanger Hospital Chattanooga, Tenn Med Surg Ob Gyn
St Thomas Hospital, Nashville Tenn Med Surg
University of Virginia Hospital, Charlottesville, Va Surg Med
Jefferson Hospital Roanoke Va Med Ob Gyn

STRAIGHT

Total Number of Approved Problems, 233

INTERNAL MEDICINE

Number of Approved Programs, 79

Veterans Admin	ngeles
Veterans Admin	, Ga
Veterans Admin	City
Veterans Admin	Texas
Veterans Admin	City
University Hospit	Ala
University	Ark
Los Angel	geles
University	geles
Stanford	cisco
University	cisco
Grace New	onn
Georgetow	D C
Jackson	Miami
Grady Me	Ga
Eugene Talmadge Memorial Hospital	Augusta, Ga
Emory Univers	rsity, Ga
Michael Reese	Chicago
University of K	ity, Kan
Louisville Gene	ville Ky
Ochsner Found	Orleans
Baltimore City	Baltimore
Church Home	Baltimore
Johns Hopkins	Baltimore
Sinai Hospital	altimore
	altimore
	Boston
	Boston
	Boston
	Boston
	Boston
	Boston
	Minneapolis
	Minneapolis
Barnes	St Louis
St Lou	St Louis
St Mar	St Louis
Jersey C	City, N J
Albany	any, N Y
Cumberl	Brooklyn
Jewish	Brooklyn
Kings	Brooklyn
Long	Brooklyn
Maimonides Hospital	Brooklyn

INTERNAL MEDICINE—Continued

Methodist Hospital	Brooklyn
St. John's Episcopal Hospital	Brooklyn
Buffalo General Hospital	Buffalo
Mary Imogene Bassett Hospital	Cooperstown, N. Y.
Charles S. Wilson Memorial Hospital	Johnson City, N. Y.
Bellevue Hospital Center Division II—Medical Cornell University	New York City
Bellevue Hospital Center Division III—Medical New York University College of Medicine	New York City
Bellevue Hospital Center Division IV—Medical New York University Postgraduate Medical School	New York City
Bronx Municipal Hospital Center	New York City
Knickerbocker Hospital	New York City
New York Hospital	New York City
Presbyterian Hospital	New York City
St. Clare's Hospital	New York City
St. Vincent's Hospital	New York City
Genesee Hospital	Rochester, N. Y.
Rochester General Hospital	Rochester, N. Y.
Strong Memorial-Rochester Municipal Hospital	Rochester, N. Y.
State University of New York Upstate Medical Center	Syracuse, N. Y.
North Carolina Memorial Hospital	Chapel Hill, N. C.
Duke Hospital	Durham, N. C.
Watts Hospital	Durham, N. C.
North Carolina Baptist Hospital	Winston-Salem, N. C.
City Hospital	Cleveland
University Hospitals	Cleveland
University Hospitals	Columbus, Ohio
Vanderbilt University Hospital	Nashville, Tenn.
Baylor University Hospital	Dallas, Texas
Parkland Memorial Hospital	Dallas, Texas
St. Paul's Hospital	Dallas, Texas
Jefferson Davis Hospital	Houston, Texas
Methodist Hospital	Houston, Texas
Salt Lake County General Hospital	Salt Lake City
University of Virginia Hospital	Charlottesville, Va.
Chesapeake and Ohio Hospital	Clifton Forge, Va.
Medical College of Virginia Hospital Division	Richmond, Va.

PATHOLOGY

Number of Approved Programs, 31

University Hospital	Little Rock, Ark.
University of California Hospital The Medical Center	Los Angeles
St. Luke's Hospital	San Francisco
University of California Hospitals	San Francisco
Grace-New Haven Community Hospital	New Haven, Conn.
Emory University Hospital	Emory University, Ga.
Michael Reese Hospital	Chicago
University of Kansas Medical Center	Kansas City, Kan.
Baltimore City Hospitals	Baltimore
Johns Hopkins Hospital	Baltimore
Boston City Hospital	Boston
Childrens Medical Center	Boston
Massachusetts General Hospital	Boston
Massachusetts Memorial Hospitals	Boston
University of Missouri Medical Center	Columbia, Mo.
Barnes Hospital	St. Louis
Jersey City Hospital	Jersey City, N. J.
Kings County Hospital Center	Brooklyn
Bellevue Hospital Center, Division III—Pathology	New York City
New York Hospital	New York City
New York University College of Medicine	New York City
Presbyterian Hospital	New York City
Genesee Hospital	Rochester, N. Y.
Strong Memorial-Rochester Municipal Hospital	Rochester, N. Y.
North Carolina Memorial Hospital	Chapel Hill, N. C.
Duke Hospital	Durham, N. C.
North Carolina Baptist Hospital	Winston-Salem, N. C.
University Hospitals	Cleveland
University of Oklahoma Hospitals	Oklahoma City
Good Samaritan Hospital	Portland, Ore.
Vanderbilt University Hospital	Nashville, Tenn.
University of Texas Hospital	Galveston, Texas

OBSTETRICS AND GYNECOLOGY

Number of Approved Programs, 7

University Hospital	Little Rock, Ark.
Johns Hopkins Hospital	Baltimore
University of Minnesota Hospitals	Minneapolis
Barnes Hospital	St. Louis
Jewish Hospital	Brooklyn
Duke Hospital	Durham, N. C.
Watts Hospital	Durham, N. C.

PEDIATRICS

Number of Approved Programs, 50

University Hospital and Hillman Clinic	Birmingham, Ala.
University Hospital	Little Rock, Ark.
Childrens Hospital	Los Angeles
University of California Hospital The Medical Center	Los Angeles
Stanford University Hospitals	San Francisco
University of California Hospitals	San Francisco
Grace-New Haven Community Hospital	New Haven, Conn.
Grady Memorial Hospital	Atlanta, Ga.
Michael Reese Hospital	Chicago
University of Chicago Clinics	Chicago
University of Kansas Medical Center	Kansas City, Kan.
Louisville General Hospital	Louisville, Ky.
Baltimore City Hospitals	Baltimore
Johns Hopkins Hospital	Baltimore
Sinai Hospital	Baltimore
University Hospital	Baltimore
Boston City Hospital	Boston

PEDIATRICS—Continued

Boston Floating Hospital	Boston
Children's Medical Center	Boston
Massachusetts General Hospital	Boston
Northwestern Hospital	Minneapolis
University of Minnesota Hospitals	Minneapolis
Childrens Mercy Hospital	Kansas City, Mo.
St. Louis Children's Hospital	St. Louis
St. Louis City Hospital	St. Louis
St. Mary's Group of Hospitals	St. Louis
Jersey City Hospital	Jersey City, N. J.
Cumberland Hospital	Brooklyn
Jewish Hospital	Brooklyn
Kings County Hospital	Brooklyn
Methodist Hospital	Brooklyn
St. John's Episcopal Hospital	Brooklyn
Children's Hospital	Buffalo
Bellevue Hospital Center, Division III—Pediatrics New York University College of Medicine	New York City
Bronx Municipal Hospital Center	New York City
New York Hospital	New York City
St. Luke's Hospital	New York City
Strong Memorial-Rochester Municipal Hospital	Rochester, N. Y.
State University of New York Upstate Medical Center	Syracuse, N. Y.
North Carolina Memorial Hospital	Chapel Hill, N. C.
Duke Hospital	Durham, N. C.
North Carolina Baptist Hospital	Winston-Salem, N. C.
City Hospital	Cleveland
University Hospitals	Cleveland
Vanderbilt University Hospital	Nashville, Tenn.
Children's Medical Center	Dallas, Texas
Jefferson Davis Hospital	Houston, Texas
Salt Lake County General Hospital	Salt Lake City
Children's Orthopedic Hospital	Seattle
Milwaukee Children's Hospital	Milwaukee

SURGERY

Number of Approved Programs, 65

University Hospital	Little Rock, Ark.
University of California Hospital The Medical Center	Los Angeles
Stanford University Hospitals	San Francisco
University of California Hospitals	San Francisco
Grace-New Haven Community Hospital	New Haven, Conn.
Grady Memorial Hospital	Atlanta, Ga.
Emory University Hospital	Emory University, Ga.
Michael Reese Hospital	Chicago
Provident Hospital	Chicago
Indiana University Medical Center	Indianapolis
University of Kansas Medical Center	Kansas City, Kan.
Baltimore City Hospitals	Baltimore
Johns Hopkins Hospital	Baltimore
Sinai Hospital	Baltimore
University Hospital	Baltimore
Beth Israel Hospital	Boston
Boston City Hospital	Boston
Massachusetts General Hospital	Boston
Massachusetts Memorial Hospitals	Boston
New England Center Hospital	Boston
Peter Bent Brigham Hospital	Boston
Northwestern Hospital	Minneapolis
University of Minnesota Hospitals	Minneapolis
Barnes Hospital	St. Louis
St. Louis City Hospital	St. Louis
St. Mary's Group of Hospitals	St. Louis
Jersey City Hospital	Jersey City, N. J.
Albany Hospital	Albany, N. Y.
Cumberland Hospital	Brooklyn
Kings County Hospital Center	Brooklyn
Long Island College Hospital	Brooklyn
Methodist Hospital	Brooklyn
St. John's Episcopal Hospital	Brooklyn
Buffalo General Hospital	Buffalo
Elmhurst General Hospital	Elmhurst, N. Y.
Bellevue Hospital Center, Division I—Surgical Columbia University	New York City
Bellevue Hospital Center, Division II—Surgical Cornell University	New York City
Bellevue Hospital Center, Division III—Surgical New York University College of Medicine	New York City
Bellevue Hospital Center, Division IV—Surgical New York University Postgraduate Medical School	New York City
Bronx Municipal Hospital Center	New York City
Knickerbocker Hospital	New York City
Lebanon Hospital	New York City
New York Hospital	New York City
Presbyterian Hospital	New York City
St. Clare's Hospital	New York City
St. Vincent's Hospital	New York City
Genesee Hospital	Rochester, N. Y.
Highland Hospital	Rochester, N. Y.
Rochester General Hospital	Rochester, N. Y.
Strong Memorial-Rochester Municipal Hospital	Rochester, N. Y.
State University of New York Upstate Medical Center	Syracuse, N. Y.
North Carolina Memorial Hospital	Chapel Hill, N. C.
Duke Hospital	Durham, N. C.
North Carolina Baptist Hospital	Winston-Salem, N. C.
City Hospital	Cleveland
Cleveland Clinic Hospital	Cleveland
University Hospitals	Cleveland
University Hospitals	Columbus
Vanderbilt University Hospital	Nashville, Tenn.
Baylor University Hospital	Dallas, Texas
Jefferson Davis Hospital	Houston, Texas
Methodist Hospital	Houston, Texas
University of Virginia Hospital	Charlottesville, Va
Medical College of Virginia Hospital Division	Richmond, Va.

APPROVED RESIDENCIES AND FELLOWSHIPS

Council on Medical Education and Hospitals of the American Medical Association
535 North Dearborn Street, Chicago 10
Revised to August 15, 1958
Hospitals, 1,276; Assistant Residencies and Residencies, 31,665

The following services are approved by the Council on Medical Education and Hospitals as meeting the requirements of the Essentials of Approved Residencies and Fellowships. In those specialties in which certifying boards have been established approval is extended in concurrence with the Board concerned as indicated. The number of years of training for which approval has been granted is indicated in the column, "Length of Approved Program (years)." Residencies in which this designation does not appear have been approved without specifying the number of years for which they are accredited. The beginning stipends for Federal hospitals have not been listed; they are established in accordance with government pay tables.

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1. ALLERGY

Residency programs in the following hospitals have been approved for ONE year of training by the Council and the Subspecialty Board for Allergy of the American Board of Internal Medicine.

Hospitals, 23; Assistant Residencies and Residencies, 49

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered[8]	Total Residencies Offered[8]	Beginning Stipend (Month)
UNITED STATES ARMY							
Army Medical Center[1-3]	Washington, D. C.	H. Ratcliffe	379	13,004	2	2	...
UNITED STATES NAVY							
U. S. Naval Hospital[1]	San Diego, Calif.	J. E. Gorman	1,550	7,779	1	1	...
NONFEDERAL AND VETERANS ADMINISTRATION							
Veterans Admin. Hospital[1-3]	Long Beach, Calif	K. H. Thayer	471	41	..	1	...
Kaiser Foundation Hospital[1-3]	San Francisco	B. F. Feingold	...	71,112	..	2	200
Michael Reese Hospital[1-3]	Chicago	M. M. Mosko--A. Matheson	127	3,927	1	2	125
Northwestern University Medical Center[1-3]	Chicago	S. Feinberg	150	3,491	2	2	225
University of Illinois Research and Educational Hospitals[1-3]	Chicago	M. Samter	23	6,988	1	1	140
Massachusetts General Hospital[1-3]	Boston	R. L. Berg	...	7,798	2	2	67
University Hospital[1-3]	Ann Arbor, Mich.	J. M. Sheldon	25	10,833	2	5	250
Mayo Foundation	Rochester, Minn.		Incl. in Int. Med.		..	..	175
Barnes Hospital[1-3]	St. Louis	J. W. Noah	Incl. in Int. Med.		1	2	50
Jewish Hospital[1-3]	Brooklyn, N.Y.	M. Grolnick	46	7,342	1	1	100
Buffalo General Hospital[1-3]	Buffalo	C. Arbesman	Incl. in Int. Med.		..	..	...
Roosevelt Hospital[1]	New York City	R. A. Cooke	174	40,964	4	4	200
Duke Hospital[1-3]	Durham, N. C.	O. Hansen-Pruss	169	513	1	2	200
Ohio State University Hospitals University Hospital[1-3]	Columbus, Ohio	J. H. Mitchell	...	2,551	..	1	252
Hospital of the University of Pennsylvania[1-3]	Philadelphia	E. Hildreth	Incl. in Int. Med.	2,448	4	8	...
Temple University Hospital[1-3]	Philadelphia	L. Tuft	...	4,499	1	1	...
Montefiore Hospital[1-3]	Pittsburgh	L. H. Criep	59	13,175	1	1	225
Veterans Admin. H	Pittsburgh	L. H. Criep	306	14,900	3	3	...
University of Virgir	Va.	O. Swineford, Jr.	243	3,172	..	6	210
Medical College of	Va.	M. E. B. Owens	...	6,350	..	1	125
University Hospitals[1-3]	Madison, Wis.	S. B. Crepea	...	4,939	1	1	200

2. ANESTHESIOLOGY

Residency programs in the following hospitals have been approved for TWO years of training by the Council and the American Board of Anesthesiology, through the Residency Review Committee for Anesthesiology.
Hospitals, 228; Assistant Residencies and Residencies, 1,363

Name of Hospital	Location	Chief of Service	Total Anesthetics	Inhalation Anesthetics	First Year Residencies Offered[8]	Total Residencies Offered[8]	Beginning Stipend (Month)
UNITED STATES AIR FORCE							
U. S. Air Force Hospital	San Antonio, Texas	A. B. Tarrow	7,192	3,709	3	6	...

Numerical and other references will be found on pages 640 through 642.

2. ANESTHESIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Total Anesthetics	Inhalation Anesthetics	First Year Residencies Offered [8]	Total Residencies Offered [9]	Beginning Stipend (Month)
UNITED STATES ARMY							
Letterman Army Hospital [1-3]	San Francisco	J. Kellogg, Jr.	5,845	2,547	..	2	...
Fitzsimons Army Hospital [1-3]	Denver	C. H Mitchell	5,663	2,801	..	2	...
Army Medical Center [1-3]	Washington, D. C.	H. C. Slocum	12,286	5,571	4	10	...
Brooke Army Hospital [1-3]	San Antonio, Texas	J. A. Jenicek	6,705	2,528	4	10	...
UNITED STATES NAVY							
U. S. Naval Hospital [1-3]	Oakland, Calif.	E. E. Parker	9,996	1,153	2	4	...
U. S. Naval Hospital [1]	San Diego, Calif.	J. M. Hanner	13,737	2,366	3	3	...
U. S. Naval Hospital [1-3]	Bethesda, Md.	J. G. Kurfees	8,882	2,458	3	4	...
U. S. Naval Hospital [1-3]	Chelsea, Mass.	D. R. Buechel	5,644	1,215	3	3	...
U. S. Naval Hospital [1]	St. Albans, N. Y.	D. M. Pino	6,516	564	2	4	...
U. S. Naval Hospital [1-3]	Philadelphia	T. C. Deas	6,508	1,354	1	2	...
UNITED STATES PUBLIC HEALTH SERVICE							
U. S. Public Health Service Hospital [1-3]	Stapleton, S. I., N. Y.	K. F. Urbach	3,291	1,317	2	4	...
NONFEDERAL AND VETERANS ADMINISTRATION							
University of Alabama Medical Center							
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	A. McNeal	10,419	9,111	2	4	108
Lloyd Noland Hospital [1-3]	Fairfield, Ala.	R. W. Grady	3,702	1,650	2	3	250
St. Vincent Infirmary [1-3]	Little Rock, Ark.	J. P. Hickey	7,176	1,809	4	8	300
University Hospital [1-3]	Little Rock, Ark.	C. W. Shafer	3,185	1,996	3	5	...
General Hospital of Fresno County [1-3]	Fresno, Calif.	A. D. Cohen	1,874	1,676	..	1	300
Loma Linda Sanitarium and Hospital [1-3]	Loma Linda, Calif.	B. D. Briggs	2,995	2,398	2	4	215
Los Angeles County Hospital [1-91]	Los Angeles	J. Denson	14,914	10,691	14	27	246
University of California Hospital [1-3]	Los Angeles	J. B. Dillon	3,682	2,552	4	8	229
Veterans Admin. Hospital [1-3]	Los Angeles	N. H. Rupp	5,156	144	6	12	...
White Memorial Hospital [1-3-50]	Los Angeles	F. E. Leffingwell	5,671	3,549	5	10	215
Highland-Alameda County Hospital [1-3]	Oakland, Calif.	C. H. Gallup	5,444	2,445	4	8	200
Kaiser Foundation Hospital [1-3]	San Francisco	E. P. Shannon	5,364	4,102	3	6	200
Mount Zion Hospital [1-3]	San Francisco	A. J. Harris	5,379	3,425	1	2	150
St. Francis Memorial Hospital [1-3]	San Francisco	J. E. Cann	5,375	5,164	3	3	300
St. Joseph's Hospital [1-3]	San Francisco	R A. Simpson	4,211	1,692	1	2	300
San Francisco Hospital							
[illegible] Service [1]	San Francisco	B. Sorkin	5,700	2,594	3	6	205
[illegible]spitals [1-3-76-78]	San Francisco	P. J. Bailey	6,820	735	2	3	100
[illegible] Hospitals [3]	San Francisco	S. R. Cullen	5,350	4,826	5	10	231
[illegible]spital [1-3]	San Jose, Calif.	H. Matthews—J. W. Pender	2,108	1,635	1	2	260
University of Colorado Medical Center							
Colorado General Hospital [1-3]	Denver	R. W. Virtue	4,031	1,906	5	9	180
Denver General Hospital [1-3]	Denver	R. W. Virtue	3,144	1,632	..	..	179
Veterans Admin. Hospital [1-3-91]	Denver	F. Brown	2,011	1,195	2	3	...
Bridgeport Hospital [1-3]	Bridgeport, Conn.	D. Massey	9,817	3,314	1	2	240
Hartford Hospital [1-3-100]	Hartford, Conn.	R. M. Tovell	44,728	17,717	10	20	150
St. Francis Hospital [1-3]	Hartford, Conn.	S. J. Martin	19,400	7,405	3	6	175
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	N. M. Greene	13,100	11,389	3	8	140
Hospital of St. Raphael	New Haven, Conn.	M. Garofalo	9,289	7,401	2	4	150
St. Mary's Hospital [1-3]	Waterbury, Conn.	W. De Wald	8,239	3,911	2	4	225
District of Columbia General Hospital [1-3]	Washington, D. C.	S. N. Albert	5,425	4,514	3	5	233
Georgetown University Hospital [1-3]	Washington, D. C.	T. F. McDermott	9,657	6,418	6	11	175
George Washington University Hospital [1-3]	Washington, D. C.	C. S. Coakley	11,424	9,850	7	14	150
Providence Hospital [3]	Washington, D. C.	W. Devlin	12,021	10,365	1	2	...
Washington Hospital Center [1-3]	Washington, D. C.	W. Bageant	6,955	6,565	4	8	...
Jackson Memorial Hospital [1-3]	Miami, Fla.	J. G. Converse	14,386	9,932	2	6	75
Medical College of Georgia Hospitals							
Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga.	P. P. Volpitto	1,227	934	6	12	250
University Hospital [1]	Augusta, Ga.	A. J. Waters	5,650	4,421	4	6	200
Emory University Hospital [1-3]	Emory University, Ga.	W. H. Galvin	6,597	5,673	1	2	235
Memorial Hospital of Chatham County [1-3]	Savannah, Ga.	M. L. Miller	2,525	2,031	1	1	350
Illinois Masonic Hospital [1-3]	Chicago	I. A. Iles	5,800	4,813	1	1	115
Michael Reese Hospital [1-3]	Chicago	J. Bolgla	9,704	4,217	2	4	125
Mount Sinai Hospital [1-3]	Chicago	R. Weyl	5,921	5,224	3	6	225
Northwestern University Medical Center		M. Karp	.....	.....	..	..	...
Chicago Wesley Memorial Hospital [1-3]	Chicago	.....	12,563	10,793	2	4	100
Passavant Memorial Hospital	Chicago	.....	4,600	4,334	1	2	125
Veterans Admin. Research Hospital	Chicago	.....	1,133	869	1	2	...
Presbyterian-St. Luke's Hospital							
Presbyterian Hospital Division [1-3]	Chicago	P. W. Searles	6,408	4,992	3	6	125
St. Luke's Hospital Division [1-3]	Chicago	P. W. Searles	5,982	4,863	5	9	125
University of Chicago Clinics [1-3]	Chicago	E. T. Morch	10,587	6,835	5	11	200
University of Illinois Research and Educational Hospitals [1-3]	Chicago	M. S. Sadove	7,273	3,451	6	12	140
Evanston Hospital [1-3]	Evanston, Ill.	C. A. Baldwin, Jr.	7,051	1,621	1	2	225
Veterans Admin Hospital [1-3]	Hines, Ill.	M. Sadove	3,361	1,853	4	6	...
St. Joseph's Hospital [3-140]	Joliet, Ill.	L. D. Ruttle	6,611	3,995	2	4	370
Indianapolis General Hospital [1-3]	Indianapolis	R E. Vore	4,853	3,699	3	6	205
Indiana University Medical Center [1]	Indianapolis	V. K. Stoelting	10,993	7,877	7	14	165
State University of Iowa Hospitals [1-3]	Iowa City	W. K. Hamilton	12,174	7,567	7	14	175
Veterans Admin. Hospital [1-3]	Des Moines, Iowa	J. L. Bailey	3,113	470	3	6	...
Veterans Admin. Hospital [1-3]	Iowa City	L. J. Debacker	1,596	314	2	4	...
University of Kansas Medical Center [1-3]	Kansas City, Kans.	P. Lorhan	8,269	4,273	3	10	125
Veterans Admin. Hospital [1-3]	Kansas City, Mo.	H. E. Hash	2,896	267	..	..	...
St. Francis Hospital [1-3]	Wichita, Kan.	R. T. Parmley	9,548	1,679	3	6	275
University of Louisville Medical Center							
Louisville General Hospital [1-3]	Louisville, Ky.	E. H. Conner	6,025	2,525	4	8	125
Charity Hospital of Louisiana [1]	New Orleans	J. Adriani	24,196	14,233	6	12	125
Ochsner Foundation Hospital [1-3]	New Orleans	G. B. Grant	9,745	4,602	3	6	225
Eastern Maine General Hospital [1-3]	Bangor, Maine	C. S. Dwyer	6,497	5,468	1	2	125
Central Maine General Hospital [1]	Lewiston, Maine	G. Clapperton	4,181	3,770	1	1	225
Maine Medical Center [1]	Portland, Maine	J. R. Lincoln	7,847	5,615	4	4	125
Baltimore City Hospitals [1-3]	Baltimore	P Safar	3,122	1,913	3	6	125
University Hospital [1]	Baltimore	M. Helrich	8,000	5,704	5	10	150
Boston City Hospital [1-3]	Boston	P. S. Marcus	13,774	6,336	...	15	182

Numerical and other references will be found on pages 640 through 642.

2. ANESTHESIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Total Anesthetics	Inhalation Anesthetics	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
Lahey Clinic [1-3]	Boston	U. H. Eversole	7,680	5,172	10	20	200
Massachusetts General Hospital [1-3]	Boston	H. K. Beecher	14,925	5,950	6	14	67
Massachusetts Memorial Hospitals [1-3]	Boston	E. Sneddon	3,457	2,662	2	4	175
New England Center Hospital [1-3]	Boston	B. E. Etsten	3,012	1,807	4	9	100
New England Deaconess Hospital [1-3]	Boston	L. V. Hand—F. J. Audin	8,155	2,807	4	7	200
New England Hospital [1-3]	Boston	E. E. Bartlett	3,318	2,848	2	2	85
Peter Bent Brigham Hospital [1-3]	Boston	L. D. Vandam	3,840	2,300	..	2	100
St. Elizabeth's Hospital [1-3]	Boston	L. Zentgraf	10,996	4,069	1	2	125
Veterans Admin. Hospital [1-3]	Boston (Jamaica Plain)	F. C. Callahan	3,819	2,575	2	2	160
Cambridge City Hospital [1-3]	Cambridge, Mass.	D. L. Mahler	4,760	1,514	1	2	...
Mount Auburn Hospital [1-3]	Cambridge, Mass.	J. H. Buskirk	5,929	2,911	2	4	150
Holyoke Hospital [3]	Holyoke, Mass.	M. G. Black	4,630	2,431	2	2	150
Springfield Hospital [1-3]	Springfield, Mass.	C. Bryant	6,859	1,296	1	2	125
St. Vincent Hospital	Worcester, Mass.	W. J. Martin, Jr.	10,684	3,775	2	4	175
University Hospital [1-3-191]	Ann Arbor, Mich.	R. B. Sweet	9,588	3,458	3	6	160
Harper Hospital [1-3]	Detroit	A. B. Stearns	18,014	5,162	2	4	275
Henry Ford Hospital [1-3]	Detroit	P. R. Dumke	13,143	3,571	5	10	250
Providence Hospital [1-3]	Detroit	N. M Bittrich	6,544	1,586	2	4	275
Receiving Hospital [1-3-205]	Detroit	F. Greifenstein	9,200	2,676	7	16	303
Sinai Hospital [1-3]	Detroit	E. M. Brown	7,650	3,820	2	4	275
Butterworth Hospital [1-3]	Grand Rapids, Mich.	M. L. Byrd	11,577	10,458	1	2	300
University of Minnesota Hospitals [1-3-211]	Minneapolis	F. Van Bergen	17,530	9,700	12	30	233
Mayo Foundation	Rochester, Minn.	A. Faulconer, Jr.	34,000	26,000	5	18	175
University of Missouri Medical Center [1]	Columbia, Mo.	K. K. Keown	1,844	1,285	..	..	200
Barnes Hospital [1-3]	St. Louis	R. B Dodd	17,975	11,036	4	8	150
St. John's Hospital [1-3]	St Louis	S. Brown	8,158	6,099	1	2	200
Veterans Admin. Hospital [1-3]	St Louis	H. W. Crouch	3,593	1,175	2	4	...
St. John's Hospital	Springfield, Mo.	O. B. Crawford	4,090	3,149	2	2	300
University of Nebraska Hospital [1-3]	Omaha	J. L. Barmore	2,022	584	1	2	200
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	R. H. Barrett	6,167	3,392	2	4	218
Hackensack Hospital [1-3]	Hackensack, N. J.	L. W. Netz	9,179	7,572	1	3	150
Jersey City Medical Center	Jersey City, N. J.	W. J. Gleeson	5,820	1,884	3	6	108
St. Joseph Hospital [1-3]	Paterson, N. J.	E. T. Lawless	7,031	5,800	2	4	200
Albany Hospital [1-3]	Albany, N. Y.	C. M. Landmesser	9,512	5,970	5	12	160
Bethel Hospital [1-3]	Brooklyn, N. Y.	A. C. Goldfeder	7,430	2,760	1	2	150
Jewish Hospital [1-3]	Brooklyn, N. Y	I. Pallin	11,500	7,700	6	7	100
Kings County Hospital Center	Brooklyn, N. Y	M Harmel	9,467	8,123	4	12	105
Maimonides Hospital [1-3]	Brooklyn, N. Y.	L. Holzmann	9,690	5,720	2	3	75
Methodist Hospital [1-3]	Brooklyn, N. Y.	G. Wallace	4,470	4,329	1	2	175
St. Catherine's Hospital [1-3]	Brooklyn, N. Y.	F. P. Ansbro	4,079	2,619	2	3	125
Veterans Admin. Hospital [1-3]	Brooklyn, N. Y.	H I. Lipson	2,352	782	3	5	...
Buffalo General Hospital [1-3]	Buffalo	R. N. Terry	15,140	563	2	4	175
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	B. D. King	3,248	2,641	3	5	247
Millard Fillmore Hospital [1-3]	Buffalo	E. D. Babbage	27,672	10,220	1	2	285
Veterans Admin. Hospital [1-3]	Buffalo	S. I. Guest	3,452	1,235	2	3	...
Flushing Hospital and Dispensary [1-3]	Flushing, N. Y.	E. Apogi	13,270	8,421	1	2	175
Long Island Jewish Hospital [1-3]	New Hyde Park, N. Y.	S. N. Surks	5,731	4,089	2	4	75
Bellevue Hospital Center Div. IV—New York University Post-Graduate Medical School [270]	New York City	E. A. Rovenstine	20,400	8,281	10	22	105
Beth Israel Hospital [1-3]	New York City	S. G. Hershey	3,905	2,872	2	5	155
Bronx Municipal Hospital Center [1-3]	New York City	L. R. Orkin	6,675	5,340	8	16	125
Harlem Hospital [1-3]	New York City	H. D. Mayer	5,809	3,950	1	2	105
Hospital For Joint Diseases [1-3]	New York City	A. M. Betcher	3,502	2,448	2	3	80
Lenox Hill Hospital [1-4]	New York City	G. Rich	6,626	6,432	2	3	180
Memorial Center for Cancer and Allied Diseases [1-3]	New York City	W. S. Howland	7,500	6,000	2	9	200
James Ewing Hospital			...	...	..	..	...
Memorial Hospital			...	...	..	..	...
Montefiore Hospital [1-3]	New York City	E. Kepes	3,668	370	5	6	187
Mount Sinai Hospital [1-3]	New York City	M. H. Adelman	12,885	7,320	4	7	75
New York Hospital [1-3]	New York City	J. F. Artusio	17,400	14,400	5	10	164
New York Medical College—Metropolitan Medical Center		F. E. Fierro	.....	.....	..	..	...
Flower and Fifth Avenue Hospitals [1-3]	New York City		6,282	307	2	4	...
Metropolitan Hospital [1-3]	New York City		4,216	2,989	4	9	105
New York Polyclinic Medical School and Hospital [1]	New York City	J. Milowsky	6,655	4,012	4	8	125
Presbyterian Hospital [1]	New York City	E. M. Papper	22,301	16,659	12	26	250
St. Clare's Hospital [1-3]	New York City	J. Lawrence	3,306	1,727	1	2	200
St. Luke's Hospital [1-3]	New York City	G. E. Burford	6,366	3,475	3	6	100
St. Vincent's Hospital [1-3]	New York City	R. G. Hicks	5,858	3,150	3	6	150
Veterans Admin. Hospital (Bronx) [1-3]	New York City	B. J. Cillberti	4,740	1,314	5	9	...
Genesee Hospital [1-3]	Rochester, N. Y.	E. Kistler	6,978	5,072	1	2	175
Rochester General Hospital [1-3]	Rochester, N. Y.	V. J. Coviello	...	...	2	4	125
St. Mary's Hospital [1-3]	Rochester, N. Y.	M. Weingarten	9,654	7,120	2	4	230
Strong Memorial—Rochester Municipal Hospitals [1-3]	Rochester, N. Y.	V. Thomas	8,539	6,771	4	5	117
Ellis Hospital [1-3]	Schenectady, N. Y.	H. A. Snell	9,001	5,936	1	2	150
St. Joseph's Hospital [1-3]	Syracuse, N. Y.	C. J. Geiger	6,146	5,116	1	1	233
State University of New York Upstate Medical Center [1-3]	Syracuse, N. Y.	E. J. Delmonico	10,516	3,830	3	8	233
Grasslands Hospital [1-3]	Valhalla, N. Y.	H. F. Bishop	1,913	1,004	1	3	175
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	D. A Davis	4,286	3,064	3	7	166
Duke Hospital [1-3]	Durham, N. C.	C. R. Stephen	7,053	6,374	6	12	200
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	D. L. Crandell	7,741	6,008	1	2	125
Mercy Hospital [1-3]	Canton, Ohio	E C. Reno	7,397	5,705	3	3	200
Christ Hospital [1]	Cincinnati	E. Hartenian	11,564	2,511	1	2	200
Cleveland Clinic Hospital [1-3]	Cleveland	D. E. Hale	12,282	7,650	4	8	175
Cuyahoga County Hospital [1-3]	Cleveland	H. E Kretchmer	8,373	3,472	2	5	162
Fairview Park Hospital [1-3]	Cleveland	J. E. Walkow ak	7,638	4,894	2	4	200
Huron Road Hospital [1-3]	Cleveland	J. K. Potter	16,512	7,332	5	10	150
Mount Sinai Hospital [1-3]	Cleveland	S. Katz	10,896	5,911	2	4	215
St. Alexis Hospital [1-3]	Cleveland	M. Oppenheim	5,695	3,361	2	4	250
St. Luke's Hospital [1-3]	Cleveland	B. B. Sankey	13,294	5,165	2	4	200
University Hospitals [1-3]	Cleveland	R. A. Hingson	16,978	7,953	5	10	150
Ohio State University Hospitals University Hospital [1-3]	Columbus, Ohio	J. J. Jacoby	12,687	9,428	10	21	177

Numerical and other references will be found on pages 640 through 642.

2. ANESTHESIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Total Anesthetics	Inhalation Anesthetics	First Year Residencies Offered [a]	Total Residencies Offered [a]	Beginning Stipend (Month)
Marymount Hospital [1-3]	Garfield Heights, Ohio	N. G. De Piero	5,396	2,559	2	4	200
Mercy Hospital [1-3]	Hamilton, Ohio	J. Uhl	6,486	5,435	1	2	200
Youngstown Hospital [1-3]	Youngstown, Ohio	D. W. Metcalf	16,452	8,580	4	8	325
University of Oklahoma Hospitals [1-3]	Oklahoma City	J. M. White	4,795	3,902	4	8	200
Veterans Admin. Hospital [3]	Oklahoma City	J. M. White	1,793	835	2	2	...
University of Oregon Medical School Hospitals and Clinics [1-3]	Portland, Ore.	F. H[illegible]	5,850	2,938	3	7	125
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	J. M[illegible]	5,105	1,863	2	4	175
Conemaugh Valley Memorial Hospital [1-3]	Johnstown, Pa.	P. C. L[illegible]	9,646	4,125	2	4	300
Albert Einstein Medical Center [1-3]	Philadelphia	M. L. Bernstine	14,227	11,638	9	18	200
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	H. H. Stone	6,812	6,240	4	5	100
Hahnemann Medical College and Hospital [1-3]	Philadelphia	A. J. Catenacci	4,912	1,240	4	8	75
Hospital of the University of Pennsylvania [1-3]	Philadelphia	R. Dripps	13,800	7,200	7	21	150
Hospital of the Woman's Medical College of Pennsylvania [1-3]	Philadelphia	H. H. Stone	3,865	3,415	1	2	130
Jefferson Medical College Hospital [1-3]	Philadelphia	L. J. Hampton	10,612	8,884	3	8	150
Pennsylvania Hospital [1-3]	Philadelphia	M. V. Troncelliti	10,320	9,528	2	2	100
Philadelphia General Hospital [1-3]	Philadelphia	M. Deming	6,911	3,341	3	6	300
Presbyterian Hospital [1-3]	Philadelphia	S. Shotz	4,311	3,772	2	4	175
Temple University Hospital [1-3]	Philadelphia	L. W. K[illegible]	14,020	6,950	3	9	...
Allegheny General Hospital [1]	Pittsburgh	R. L. [illegible]	13,056	11,013	3	6	200
Mercy Hospital [1-3]	Pittsburgh	F. F. [illegible]	11,529	6,585	3	8	235
Montefiore Hospital [1-3-346]	Pittsburgh	L. G David	6,608	4,750	1	2	225
St. Francis General Hospital and Rehabilitation Institute [1-3]	Pittsburgh	G. J. Thomas	9,507	2,791	2	4	225
Reading Hospital [1-3]	Reading, Pa.	M. Kerry	7,193	3,486	2	4	225
Robert Packer Hospital [1-3]	Sayre, Pa.	W. Brehm	7,104	4,190	2	4	225
Miriam Hospital [1-3]	Providence, R. I.	N. S. Rakatansky	4,593	1,770	1	1	250
Rhode Island Hospital [1-3]	Providence, R. I.	M. Saklad	8,386	4,796	2	4	125
Teaching Hospitals of the Medical College of South Carolina	Charleston, S. C.	....	7,370	6,058	3	6	200
Medical College Hospital		....	.....	.....	..	..	...
Roper H[illegible]		....	.....	.....	..	..	...
Baroness [illegible]	[illegible]	R. Baldwin	7,624	4,431	4	6	275
University of Tennessee Memorial Research Center and Hospital [1-3]	Knoxville, Tenn.	F. Powell	2,987	1,877	1	2	320
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	B. H. Robbins	5,181	4,237	2	4	50
Parkland Memorial Hospital [1-3]	Dallas, Texas	M. T. Jenkins	7,048	3,447	8	14	225
Harris Hospital [1]	Fort Worth, Texas	A. N. Heinrichs	13,034	11,829	2	2	300
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	O. Allen	7,718	5,942	6	12	160
Baylor University Coll. of Med. Affiliated Hospitals							
Jefferson Davis Hospital [1-3]	Houston, Texas	A. S. Keats	4,745	2,667	3	6	75
Methodist Hospital [1-3]	Houston, Texas	P. H. Chalmers	8,590	6,234	3	6	220
Veterans Admin. Hospital [1-3]	Houston, Texas	W. H. Mannheimer	4,420	1,135	3	5	...
Hermann Hospital [1-3]	Houston, Texas	L. F. Schuhmacher	17,838	4,828	2	4	125
St. Joseph's Hospital [1-3]	Houston, Texas	E. A. Hoeflich	13,884	11,106	1	1	220
University of Texas M. D. Anderson Hospital and Tumor Institute [1-3]	Houston, Texas	W. S. Derrick	3,830	2,297	3	6	100
Scott and White Memorial Hospitals [1-3]	Temple, Texas	O. H. Gillespie	5,254	3,762	2	4	300
University of Utah College of Medicine Affiliated Hospitals [3]	Salt Lake City	C. M. Ballinger	2,777	197	5	10	220
University of Vermont Affiliated Hospitals							
De Goesbriand Memorial Hospital	Burlington, Vt.	E. Mills	3,250	1,029	1	2	167
Mary Fletcher Hospital [1-3]	Burlington, Vt.	J. Abajian, Jr	3,972	2,185	4	5	100
Veterans Admin. Hospital [1-3]	White River Jct., Vt.	R. E. Lapointe	1,419	549	1	2	...
University of Virginia Hospital [1-3]	Charlottesville, Va.	D. E. Eastwood	7,229	4,352	2	4	150
Medical College of Virginia—Hospital Division [1-3]	Richmond, Va.	W. E. Pembleton	16,368	5,462	2	5	200
Veterans Admin. Hospital [1-3]	Richmond, Va.	O. G. Lynch	4,330	928	1	2	...
Doctors Hospital [1-3]	Seattle	J. J. Owen	3,314	2,155	1	2	250
Swedish Hospital [1-3]	Seattle	L. H. Mousel	12,346	5,211	1	2	225
University of Washington Affiliated Hospitals							
Children's Orthopedic Hospital [1-3]	Seattle	K. Eather	3,345	3,100	..	..	100
King County Hospital Unit No. 1 (Harborview) [1]	Seattle	L. E. Morris	3,109	2,418	4	8	125
Veterans Admin Hospital [1-3]	Seattle	L. E. Morris	1,493	614	1	2	...
Virginia Mason Hospital [1-3]	Seattle	D. C. Moore	7,055	2,760	3	6	175
Tacoma General Hospital [1-3]	Tacoma, Wash.	J. J. Bonica	6,152	3,038	3	6	200
Ohio Valley General Hospital [1-3]	Wheeling, W. Va.	D. E. Greeneltch	6,569	3,442	3	6	300
University Hospitals [1-3]	Madison, Wis.	O. S. Orth	5,450	4,626	6	13	100
Veterans Admin. Hospital [1-3]	Milwaukee (Wood), Wis.	S. W. Gorens	3,705	1,972	3	6	...
San Juan City Hospital [1-3]	San Juan, P. R.	F. Gonzalez	3,745	1,804	2	4	150

3. AVIATION MEDICINE

The programs in Aviation Medicine which have been approved by the Council and the American Board of Preventive Medicine, through the Residency Review Committee for *Preventive Medicine*, will be found listed under Preventive Medicine, page 613

4. CARDIOVASCULAR DISEASE

Residency programs in the following hospitals have been approved for ONE year of training by the Council and the Subspecialty Board for Cardiovascular Disease of the American Board of *Internal Medicine*.

Hospitals, 61; Assistant Residencies and Residencies, 154

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [a]	Total Residencies Offered [a]	Beginning Stipend (Month)
UNITED STATES ARMY							
Letterman Army Hospital [1-3]	San Francisco	L. F. Parmley	987	38	1	1	...
Fitzsimons Army Hospital [1-3]	Denver	B. E. Pollock	360	11	1	1	...
Army Medical Center [1-3]	Washington, D. C.	T. W. Mattingly	544	34	2	3	...
Brooke Army Hospital [1-3]	San Antonio, Texas	R. B. Dickerson	578	50	2	2	...

Numerical and other references will be found on pages 640 through 642.

4. CARDIOVASCULAR DISEASE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
UNITED STATES NAVY							
U. S. Naval Hospital [1]	San Diego, Calif.	J. E. Gorman	914	102	1	1	...
U. S. Naval Hospital [1-3]	Bethesda, Md.	J. B. MacGregor	606	..	1	1	...
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE							
Freedmen's Hospital [1-3]	Washington, D. C.	J. B. Johnson	461	29	2	2	308
NONFEDERAL AND VETERANS ADMINISTRATION							
Veterans Admin. Hospital [1-3]	Long Beach, Calif.	E. Temkin	475	50	..	1	...
Veterans Admin. Hospital [1-3]	Los Angeles	M. L. Pearce	1,014	93	..	3	...
University of California Hospitals [3]	San Francisco	J. H. Comroe	Incl. in Int. Med.		..	1	231
Veterans Admin. Hospital [1-3]	West Haven, Conn.	M. Calabresi	Incl. in Int. Med.		2	2	...
George Washington University Hospital [1-3]	Washington, D. C.	J. M. Evans	618	50	3	6	200
Jackson Memorial Hospital [1-3]	Miami, Fla.	R. J. Boucek	808	..	2	6	75
St. Joseph's Infirmary [1-3]	Atlanta, Ga.	S. Claiborne	695	57	..	1	200
Emory University Hospital [1-3]	Emory University, Ga.	R. B. Logue	666	46	..	3	255
Children's Memorial Hospital [1-3]	Chicago	R. A. Miller	322	24	2	2	300
Michael Reese Hospital [1-3]	Chicago	L. N. Katz	965	68	5	10	...
Mount Sinai Hospital [1-3]	Chicago	A. A. Luisada	Incl. in Int. Med.		..	1	275
Indianapolis General Hospital [1-3]	Indianapolis	K. G. Kohlstaedt	248	..	..	2	300
St. Vincent's Hospital [1-3]	Indianapolis	A. B. Richter	423	21	..	1	275
University of Kansas Medical Center [1-3]	Kansas City, Kan.	E. G. Dimond	381	16	..	6	125
Maine Medical Center [1]	Portland, Maine	E. H. Drake	733	53	1	1	150
Beth Israel Hospital [1-3]	Boston	P. M. Zoll	Incl. in Int. Med.		..	2	167
Peter Bent Brigham Hospital [1-3]	Boston	G. W. Thorn	Incl. in Int. Med.		..	8	...
Veterans Admin. Hospital [1-3]	West Roxbury, Mass.	D. Littmann	324	24	..	5	...
Henry Ford Hospital [1-3]	Detroit	J. W. Keyes	2,036	148	..	4	250
Mayo Foundation	Rochester, Minn.		Incl. in Int. Med.		..	..	175
University of Nebraska Hospital [1-3]	Omaha	R. L. Grissom	403	..	..	1	...
Bergen Pines County Hospital [1-3]	Paramus, N. J.	S. Reich	529	84	1	1	350
Jewish Hospital [1-3]	Brooklyn, N. Y.	J. Weinstein	Incl. in Int. Med.		..	1	125
Buffalo General Hospital [1-3]	Buffalo	E. J. Lippschutz	Incl. in Int. Med.		1	1	200
Irvington House [1-3]	Irvington, N. Y.	A. C. De Graff-H. F. Wood	251	..	..	3	250
Lenox Hill Hospital [1-3]	New York City	C. E. Kossmann	295	..	1	1	180
Memorial Center for Cancer and Allied Diseases [1-3]		R. W. Rawson-J. LaDue	420	Incl. in Int. Med.	..	1	300
James Ewing Hospital	New York City		...	..	..	..	...
Memorial Hospital	New York City		...	..	..	..	...
Mount Sinai Hospital [1-3]	New York City	[illegible]	718	36	2	6	75
St. Luke's Hospital [1-3]	New York City	[illegible]	Incl. in Int. Med.		2	2	125
St. Francis Hospital and Sanatorium [1-3]	Roslyn, N. Y.	[illegible]	590	23	5	5	250
Grasslands Hospital [1-3]	Valhalla, N. Y.	H. Tarnower	Incl. in Int. Med.		1	1	200
Duke Hospital [1-3]	Durham, N. C.	E. S. Orgain	369	19	..	2	200
University of Cincinnati College of Medicine Hospital Group							
Cincinnati General Hospital [1-3]	Cincinnati	J. McGuire	Incl. in Int. Med.		..	..	...
St. Mary's Hospital [1-3]	Cincinnati	R. S. Green	Incl. in Int. Med.		1	1	300
Cleveland Clinic Hospital [1-3]	Cleveland	A. C. Ernstene	1,599	56	..	6	300
University Hospitals [1-3]	Cleveland	W. Pritchard	Incl. in Int. Med.		..	2	183
Ohio State University Hospitals							
University Hospital [1-3]	Columbus, Ohio	R. W. Kissane	Incl. in Int. Med.		..	2	252
White Cross Hospital [1-3]	Columbus, Ohio	R. W. Kissane	341	13	1	1	290
University of Oklahoma Medical Center		S. G. Wolf	Incl. in Int. Med.		1	3	175
University Hospital [1-3]	Oklahoma City		...	..	..	..	...
Veterans Admin. Hospital [3]	Oklahoma City		...	..	..	..	...
Veterans Admin. Hospital [1]	Portland, Ore.	L. W. Ritzmann	640	63	..	2	...
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	S. Bellet	173	...	2	2	...
Pennsylvania Hospital [1-3]	Philadelphia	J. B. Vander Veer	Incl. in Int. Med.		2	2	20
Philadelphia General Hospital [1-3]	Philadelphia	S. Bellet	Incl. in Int. Med.		6	15	121
Presbyterian Hospital [1-3]	Philadelphia	J. R. Kitchell	Incl. in Int. Med.		1	1	175
Temple University Hospital [1-3]	Philadelphia	L. A. Soloff	Incl. in Int. Med.		2	2	...
Veterans Admin. Hospital [1-3]	Philadelphia	B. H. Pastor	740	98	..	1	...
Health Center Hospitals of the University of Pittsburgh School of Medicine [1-3]	Pittsburgh	J. D. Myers	573	51	2	2	150
St. Francis General Hospital and Rehabilitation Institute [1-3]	Pittsburgh	A. P. D'Zmura	480	22	..	1	325
Rhode Island Hospital [1-3]	Providence, R. I.	F. B. Cutts	Incl. in Int. Med.		2	2	175
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	G. Herrmann	Incl. in Int. Med.		1	3	160
Veterans Admin. Hospital [1-3]	Richmond, Va.	W. T. Thompson, Jr.	1,042	67	..	2	...
University Hospitals [1-3]	Madison, Wis.	C. W. Crumpton	Incl. in Int. Med.		2	3	200

5. DERMATOLOGY

Residency programs in the following hospitals have been approved by the Council and the American Board of Dermatology, Inc., through the Residency Review Committee for Dermatology, as offering acceptable training in the specialty.

Hospitals, 77; Assistant Residencies and Residencies, 318

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES ARMY								
Letterman Army Hospital [1-3]	San Francisco	R. Williams	338	11,457	1	3	3	...
Army Medical Center [1-3]	Washington, D. C.	R. S. Higdon	232	13,708	4	12	3	...
Brooke Army Hospital [1-3]	San Antonio, Texas	G. Prazak	160	15,313	3	9	3	...
UNITED STATES NAVY								
U. S. Naval Hospital [1]	San Diego, Calif.	W. N. New	247	13,989	3	4	3	...
U. S. Naval Hospital [1-3-344]	Philadelphia	J. H. Lockwood	211	10,972	4	5	2	...

Numerical and other references will be found on pages 640 through 642.

5. DERMATOLOGY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES PUBLIC HEALTH SERVICE								
U. S. Public Health Service Hospital [1-1-205]	Stapelton, S. I., N. Y.	B. J. Chester	475	7,253	1	3	3	...
NONFEDERAL AND VETERANS ADMINISTRATION								
University of Alabama Medical Center								
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	R. O. Noojin	76	2,693	1	4	3	103
Lloyd Noland Hospital [1-3-51]	Fairfield, Ala.	P. G. Beque	78	4,988	1	1	1	250
Veterans Admin. Hospital [1-3]	Long Beach, Calif.	S. W. Becker	334	4	1	3	3	...
Los Angeles County Hospital [1]	Los Angeles	J. R. Scholtz	676	12,899	1	3	3	246
University of California Hospital [1-3]	Los Angeles	T. H. Sternberg	52	4,192	1	3	3	220
Veterans Admin. Hospital [1-3]	Los Angeles	E. T. Wright	647	19,926	3	7	3	...
White Memorial Hospital [1-3]	Los Angeles	M. Couperus	32	4,384	1	2	2	215
Stanford University Hospitals [1-3]	San Francisco	E. M. Farber	113	7,478	2	4	3	100
University of California Hospitals [3]	San Francisco	R. B. Rees	67	6,992	1	4	3	231
University of Colorado Medical Center								
Colorado General Hospital [1-3]	Denver	O. S. Philpott	13	3,381	1	3	3	180
Grace-New Haven Community Hospital [1-2]	New Haven, Conn.	A. B. Lerner	200	3,776	1	2	3	140
Jackson Memorial Hospital [1-3]	Miami, Fla.	H. Blank	26	5,132	2	6	3	75
Cook County Hospital	Chicago	S. [illegible]	286	11,626	1	3	3	200
Northwestern University Medical Center [1-3]	Chicago	H. [illegible]	...	6,040	2	6	3	...
University of Chicago Clinics [1-3]	Chicago	S. [illegible]	214	7,950	3	9	3	200
University of Illinois Research and								
Educational Hospitals [1-3-130]	Chicago	A. Rostenberg, Jr.	47	10,575	2	2	3	140
Veterans Admin. Hospital [1-3]	Hines, Ill.	L. A. Baker	614	332	1	2	1	...
Indianapolis General Hospital [1-3]	Indianapolis	J. E. Dalton	27	5,604	1	3	3	205
State University of Iowa Hospitals [1-3]	Iowa City	R. Nomland	335	3,529	1	3	3	175
Charity Hospital of Louisiana [1]	New Orleans	V. M. Henington— C. B. Kennedy— J. W. Burks	624	25,049	5	11	3	100
Johns Hopkins Hospital [1-3]	Baltimore	M. Sullivan	Incl. in Int. Med.	4,775	1	3	3	250
University Hospital [1]	Baltimore	H. M. Robinson, Jr.	175	9,003	2	3	3	75
Veterans Admin. Hospital [1-3-162]	Fort Howard, Md.	M. Sullivan	38	12	1	1	3	...
Boston City Hospital [1-3]	Boston	B. Appel	114	15,010	1	5	3	132
Massachusetts General Hospital [1-3]	Boston	M. M. Tolman	589	8,159	3	4	3	67
Massachusetts Memorial Hospitals [1-3]	Boston	H. Mescon	...	1,435	1	4	3	175
University Hospital [1-3-191]	Ann Arbor, Mich.	A. C. Curtis	745	6,874	5	15	3	160
Henry Ford Hospital [1-3]	Detroit	C. S. Livingood	377	37,746	4	12	3	250
Receiving Hospital [1-3]	Detroit	H. Pinkus	9	7,876	2	7	3	210
Minneapolis General Hospital	Minneapolis	C. W. Laymon	198	2,717	1	2	3	220
University of Minnesota Hospitals [1-3-210]	Minneapolis	F. W. Lynch	121	3,518	2	8	3	233
Veterans Admin. Hospital [1-3]	Minneapolis	I. Fisher	326	......	1	2	3	...
Mayo Foundation	Rochester, Minn.	L. A. Brunsting	718	28,541	5	15	3	175
Ancker Hospital [1-3]	St. Paul	H. G. Ravits	169	3,274	..	1	3	220
Barnes Hospital [1-3]	St. Louis	C. W. Lane	Incl. in Int. Med.		..	..	3	50
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	W. C. Lobitz	157	4,443	1	3	3	218
Kings County Hospital—Division I [1-3]	Brooklyn, N. Y.	C. T. Chiaramonte	285	10,919	1	2	1	155
Edward J. Meyer Memorial Hospital [1-3-248]	Buffalo	E. D. Osborne	83	5,543	1	4	3	247
Roswell Park Memorial Hospital	Buffalo	H. L. Traenkle	73	3,434	..	1	1	...
Bellevue Hospital Center								
Div. IV—New York University								
Post-Graduate Medical School	New York City	M. Sulzberger	306	21,786	3	7	3	71
Mount Sinai Hospital [1-3]	New York City	S. M. Peck	35	7,568	1	1	3	75
New York Hospital [1-3]	New York City	G. Lewis	Incl. in Int. Med.	10,138	1	1	3	164
New York Polyclinic Medical								
School and Hospital [1]	New York City	A. C. Cipollaro	20	5,681	1	2	3	125
New York University—Bellevue Medical Center								
University Hospital (Skin and Cancer)	New York City	M. Sulzberger	139	72,846	2	6	3	75
Presbyterian Hospital [1]	New York City	C. T. Nelson	106	36,607	2	4	3	250
St. Luke's Hospital [1-3]	New York City	L. P. Barker	29	7,282	1	1	3	100
Veterans Admin. Hospital (Bronx) [1-3]	New York City	H. Shatin	424	1,197	2	5	3	...
Veterans Admin. Hospital (Manhattan) [1-3]	New York City	P. Michaelides	428	1	5	6	3	...
Duke Hospital [1-3]	Durham, N. C.	J. L. Callaway	206	6,801	2	4	3	102
University of Cincinnati College of Medicine Hospital Group								
Cincinnati General Hospital [1-3]	Cincinnati	L. Goldman	223	4,196	3	5	3	100
Cleveland Clinic Hospital [1-3]	Cleveland	J. R. Haserick	310	15,081	2	5	3	175
Cuyahoga County Hospital [1-3]	Cleveland	R. R. Rauschkolb	118	7,392	1	3	3	162
University Hospitals [1-3]	Cleveland	R. Stoughton	65	4,228	1	3	3	150
University of Oklahoma Medical Center		J. H. Lamb	...	......	..	..	3	...
University Hospital [1-3]	Oklahoma City	....	39	1,818	1	1	..	175
Veterans Admin. Hospital	Oklahoma City	....	...	510	..	1	..	...
University of Oregon Medical								
School Hospitals and Clinics [1-3]	Portland, Ore.	T. B. Fitzpatrick	90	5,304	1	3	3	125
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	R. F. Dickey	65	10,119	1	3	3	175
Graduate Hospital of the								
University of Pennsylvania [1-3]	Philadelphia	H. Beerman	28	2,725	1	3	3	...
Hahnemann Medical College and Hospital [1-3]	Philadelphia	....	8	2,510	1	1	1	75
Hospital of the University of Pennsylvania [1-3]	Philadelphia	D. Pillsbury	138	6,386	4	12	3	...
Jefferson Medical College Hospital [1-3]	Philadelphia	H. B. Decker	19	4,596	1	1	1	100
Pennsylvania Hospital [1-3]	Philadelphia	H. Beerman	...	3,268	1	1	1	20
Philadelphia General Hospital [1-3]	Philadelphia	B. Gross	171	5,348	2	2	1	121
Skin and Cancer Hospital	Philadelphia	L. S. Wright	...	26,144	4	4	1	100
University of Texas Medical		....	...	......	..	..	..	...
Branch Hospitals [1-3]	Galveston, Texas	J. F. Mullins	113	5,596	2	6	3	100
Baylor University College of Medicine Affiliated Hospitals		....	...	.....	..	..	3	...
Jefferson Davis Hospital [1-3]	Houston, Texas	E. R. Seale	40	4,362	1	3	..	75
Methodist Hospital [1-3]	Houston, Texas	M. G. Bloom	10	.....	..	..	..	220
Texas Children's Hospital [1-2]	Houston, Texas	E. R. Seale	15	6	..	..	..	...
Veterans Admin. Hospital [1-3]	Houston, Texas	E. R. Seale	147	381	1	3	..	...
University of Virginia Hospital [1-3]	Charlottesville, Va.	E. P. Cawley	165	7,480	2	6	3	50
University Hospitals [1-3]	Madison, Wis.	S. A. M. Johnson	221	5,802	1	3	1	100
Veterans Admin. Hospital [1-3-384]	Milwaukee (Wood), Wis.	D. W. Kersting	496	6,428	1	3	3	...

Numerical and other references will be found on pages 640 through 642.

6. GASTROENTEROLOGY

Residency programs in the following hospitals have been approved for ONE year of training by the Council and the Subspecialty Board for Gastroenterology of the American Board of Internal Medicine.

Hospitals, 36; Assistant Residencies and Residencies, 83

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
UNITED STATES ARMY							
Letterman Army Hospital [1-3]	San Francisco	E. Kehoe	397	2	1	1	...
Army Medical Center [1-3]	Washington, D. C.	B. H. Sullivan, Jr.	274	6	2	2	...
NONFEDERAL AND VETERANS ADMINISTRATION							
Veterans Admin. Hospital [1-3]	Long Beach, Calif.	S. J Stempien	510	31	..	1	...
Veterans Admin. Hospital [1-3]	Los Angeles	M. I. Grossman	986	59	..	2	...
University of California Hospitals [3]	San Francisco	T. L. Althausen	Incl. in Int. Med.		..	..	...
Veterans Admin. Hospital [1-3-35]	West Haven, Conn	S. Selesnick	Incl. in Int. Med.		3	5	...
Cook County Hospital	Chicago	F. Steigmann	...	...	4	4	140
Northwestern University Medical Center							
Veterans Admin. Research Hospital [1, 3]	Chicago	E. C. Texter, Jr.	274	1	..	4	...
Indianapolis General Hospital [1-3]	Indianapolis	R. H. Moser	110	...	..	1	300
University of Kansas Medical Center [1-3]	Kansas City, Kan.	A. Klotz	106	1	2	2	125
Ochsner Foundation Hospital [1-3]	New Orleans	W. B. Davis	377	8	1	1	300
Touro Infirmary [1]	New Orleans	M. Kaplan	866	6	1	2	125
Beth Israel Hospital [1-3]	Boston	L. Zetzel	Incl. in Int. Med.		1	1	167
Lahey Clinic [1-3]	Boston	S. M. Jordan	2,936	4	8	8	200
Massachusetts Memorial Hospitals [1-3]	Boston	F. Ingelfinger	Incl. in Int. Med.		..	4	175
University Hospital [1-3]	Ann Arbor, Mich.	H. M. Pollard	...	...	2	5	160
Henry Ford Hospital [1-3]	Detroit	J. G. Mateer	1,215	20	5	6	250
Mayo Foundation	Rochester, Minn.	...	Incl. in Int. Med.		..	..	175
Jewish Hospital [1-3]	Brooklyn, N. Y.	M J. Matzner	Incl. in Int. Med.		..	1	125
Veterans Admin. Hospital [1-3]	Brooklyn, N. Y.	A. P. Ingegno	444	9	1	1	...
Mount Sinai Hospital [1-3]	New York City	H. D. Janowitz	1,243	23	..	6	75
New York Polyclinic Medical School and Hospital [1]	New York City	I. A. Feder	301	2	1	1	125
Duke Hospital [1-3]	Durham, N. C.	J. M. Ruffin	351	3	..	3	250
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	D. Cayer	1,041	...	3	3	250
University of Cincinnati							
College of Medicine Hospital Group							
Cincinnati General Hospital [1-3]	Cincinnati	L. Schiff	Incl. in Int. Med.		..	..	...
Cleveland Clinic Hospital [1-3]	Cleveland	E. N. Collins	514	8	..	1	200
Veterans Admin. Hospital [1-2]	Cleveland	H. P. Roth	744	30	2	2	...
Ohio State University Hospitals							
University Hospital [1-3]	Columbus, Ohio	C. J. De Lor	468	6	..	1	252
Veterans Admin. Hospital [1-3]	Portland, Ore.	L. W. Ritzmann	415	9	..	1	...
Graduate Hospital of the							
University of Pennsylvania [1-3]	Philadelphia	H. L. Bockus	868	21	2	2	150
Hospital of the University of Pennsylvania [1-3]	Philadelphia	T. Machella	Incl. in Int. Med.		2	6	...
Jefferson Medical College Hospital [1-3]	Philadelphia	W. A. Sodeman	208	...	1	1	100
Temple University Hospital [1-3]	Philadelphia	H. Shay	Incl. in Int. Med.		1	1	...
Veterans Admin. Hospital [1-2]	Memphis, Tenn.	M. L. Gompertz	1,151	27	1	1	...
Veterans Admin. Hospital [1-3]	Richmond, Va.	W. T. Thompson, Jr.	866	20	..	2	...
Veterans Admin. Hospital [1-3]	Milwaukee (Wood), Wis.	J. J. Levin	878	37	1	1	...

7. GENERAL PRACTICE

Residency programs in the following hospitals have been approved by the Council and the American Academy of General Practice, through the Residency Review Committee for General Practice, as offering acceptable training in this field.

Hospitals, 200; Assistant Residencies and Residencies, 888

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES AIR FORCE								
U. S. Air Force Hospital [1-3]	Montgomery, Ala.	J. A. Jarman	.....	...	4	8	2	...
U. S. Air Force Hospital	San Antonio, Texas	W. L. Kenoyer	18,734	61	3	6	2	...
UNITED STATES ARMY								
U. S. Army Hospital [1-3]	Fort Knox, Ky.	D. L. Deutsch	12,689	57	8	16	2	...
UNITED STATES NAVY								
U. S. Naval Hospital [1-3]	Oakland, Calif.	R. O. Canada	4,989	76	1	1	2	...
U. S. Naval Hospital [1]	San Diego, Calif.	M. M. Rubin	.....	...	2	4	2	...
UNITED STATES PUBLIC HEALTH SERVICE								
U. S. Public Health Service Hospital [1]	Norfolk, Va.	...	.....	...	3	6	2	...
NONFEDERAL AND VETERANS ADMINISTRATION								
Carraway Methodist Hospital [1]	Birmingham, Ala.	C. W. Neville	Incl. in Int. Med.		1	2	2	250
Good Samaritan Hospital [1]	Phoenix, Ariz.	R. A. McCulley	7,821	55	1	1	2	300
Maricopa County General Hospital [1-3]	Phoenix, Ariz.	H. M. Bunch	.....	...	6	6	2	250
St. Mary's Hospital [1-3]	Tucson, Ariz.	R. R. Bates	Incl. in Int. Med.		2	2	2	200
University of Arkansas Medical Center [1-3-41]	Little Rock, Ark.	J. T. Riggin	.....	...	12	24	2	150
St. Michael's Hospital [1-3]	Texarkana, Ark.	J. B. Kittrell	7,331	42	1	2	2	250
General Hospital of Riverside County [1]	Arlington, Calif.	...	2,668	44	6	6	2	444
Kern County General Hospital [1]	Bakersfield, Calif.	R. T. Cunningham	.....	...	4	4	2	325
St. Mary's Long Beach Hospital [3]	Long Beach, Calif.	W. L. Thompson	18,154	120	2	4	2	300
Contra Costa County Hospital [1]	Martinez, Calif.	G. Degnan	6,217	185	9	10	2	470
Stanislaus County Hospital [1]	Modesto, Calif.	R. S. Westphal	.....	...	6	8	2	500
Kaiser Foundation Hospital [1-3]	Oakland, Calif.	H. S. Holmboe	.....	...	4	4	2	315
Sacramento County Hospital [1-3]	Sacramento, Calif.	D. Ernest	13,058	528	8	12	2	300
Monterey County Hospital [1]	Salinas, Calif.	W. A. Cassidy	3,633	165	9	9	2	500

Numerical and other references will be found on pages 640 through 642.

7. GENERAL PRACTICE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Santa Barbara General Hospital	Santa Barbara, Calif.	D. M. Caldwell	2,532	77	3	6	2	450
Sonoma County Hospital	Santa Rosa, Calif.	H. D. Stalley	3,737	119	4	8	2	425
Tulare County General Hospital[1]	Tulare, Calif.	H. E. Jakes	3,660	99	5	6	2	650
General Hospital Ventura County[1-3]	Ventura, Calif.	R. W. Homer	4,644	54	5	10	2	434
Community Hospital[1-3]	Boulder, Colo.	E. B. Craven	4,227	45	1	2	2	200
Glockner-Penrose Hospital[1-3]	Colorado Springs, Colo.	M. Berthrong	6,208	98	2	2	2	200
St. Francis Hospital[1-3]	Colorado Springs, Colo.	R. W. Urich	9,274	140	2	2	1	200
St. Joseph's Hospital	Denver	F. B. McGlone	.....	...	..	..	2	200
University of Colorado Medical Center								
Colorado General Hospital[1-3]	Denver	C. W. Eisele	.....	...	8	18	2	180
Denver General Hospital[1-3]	Denver	....	.....	...	..	..	2	...
St. Mary—Corwin Hospital[1-3]	Pueblo, Colo.	F. W. Barrows	14,577	92	4	8	2	285
Bridgeport Hospital[1-3]	Bridgeport, Conn.	E. R. Connors	.....	...	1	2	2	240
Greenwich Hospital[1-3]	Greenwich, Conn.	G. Carter	8,108	147	1	1	1	150
Charlotte Hungerford Hospital[1-3]	Torrington, Conn.	M. E. Globbe	5,914	65	3	3	2	200
Wilmington General Hospital[1-3]	Wilmington, Del.	F. S. Skura	7,386	53	10	10	2	260
Eastern Dispensary and Casualty Hospital[3]	Washington, D. C.	J. R. Young	1,441	32	5	10	2	300
Halifax District Hospital[1-3]	Daytona Beach, Fla.	H. A. King	9,939	128	..	5	2	...
Baptist Memorial Hospital[1-3]	Jacksonville, Fla.	A. M. Manson	.....	...	2	4	2	325
St. Luke's Hospital[1-3]	Jacksonville, Fla.	E. E. Leitner	.....	...	1	2	2	300
St. Vincent's Hospital[3]	Jacksonville, Fla.	L. M. Wachtel	Incl. in Int. Med.		1	2	2	225
Baptist Hospital[1-3]	Pensacola, Fla.	J. R. Lundquist	10,206	83	2	4	2	200
Sacred Heart Hosp'tal	Pensacola, Fla.	F. E. Williams	.....	...	3	3	2	225
Mound Park Hospital[1]	St. Petersburg, Fla.	P. B. Kersker	4,230	78	1	2	2	290
Grady Memorial Hospital[1]	Atlanta, Ga.	W. Glenn	.....	...	8	8	2	100
Medical Center[1-3]	Columbus, Ga.	E. B. Horn	.....	...	4	4	1	250
Tri-County Hospital[1]	Fort Oglethorpe, Ga.	F. H. Simonton	.....	...	6	6	2	250
Macon Hospital[1]	Macon, Ga.	J. W. Daniel, Jr.	.....	...	8	10	2	250
MacNeal Memorial Hospital[1-3]	Berwyn, Ill.	O C. Koluvek	1,239	80	5	5	2	350
Grant Hospital[1-3]	Chicago	R. M. Mandel	.....	...	1	2	2	225
Illinois Masonic Hospital[1-3]	Chicago	J. Poticha	3,271	30	1	1	2	115
Louis A. Weiss Memorial Hospital[1]	Chicago	R. L. Simons	.....	...	4	8	2	385
St. Mary of Nazareth Hospital[1-3]	Chicago	S. A. Motto	10,479	133	1	2	2	200
South Shore Hospital[1-3]	Chicago	S. H. Gumbiner	7,247	79	2	2	1	250
Decatur and Macon County Hospital	Decatur, Ill.	C. T. Johnson	5,263	71	2	2	1	275
Methodist Hospital of Central Illinois[3]	Peoria, Ill.	H. G. Johnson	2,843	81	4	4	1	200
Methodist Hospital[1-3]	Gary, Ind.	M. Shellhouse	.....	...	1	2	2	300
Methodist Hospital[1]	Indianapolis	D. Hampshire	11,783	...	2	4	2	278
Broadlawns-Polk County Hospital[1]	Des Moines, Iowa	V. L. Schlaser	.....	...	2	2	1	250
St. Francis Hospital[1-3]	Wichita, Kan.	V. D. Schwartz	.....	...	4	4	2	275
Wesley Hospital[1-3]	Wichita, Kan.	J. Tiller	1,438	17	1	1	2	310
Wm. Booth Memorial Hospital[3]	Covington, Ky.	C. W. Air	792	17	12	12	2	...
St. Anthony Hospital[1-3]	Louisville, Ky.	T. V. Gudex	8,946	75	1	2	2	250
Lafayette Charity Hospital[1-3]	Lafayette, La.	E. Hull	3,000	112	18	18	1	375
St. Patrick's Hospital	Lake Charles, La.	V. A. McCann	9,516	40	2	4	2	250
E. A. Conway Memorial Hospital[1]	Monroe, La.	F. W. Sartor	.....	...	10	15	2	400
Touro Infirmary[1]	New Orleans	A. Goldman	.....	...	1	1	2	125
Huey P. Long Charity Hospital	Pineville, La.	M. Hon'gman	9,103	71	12	12	1	375
Maine Medical Center[1]	Portland, Maine	S. R. Branson	.....	...	1	1	2	125
Bon Secours Hospital[3]	Baltimore	F. J. Geraghty	.....	...	1	2	2	270
Doctors Hospital[1-3]	Baltimore	W A. Anderson	4,599	24	5	10	2	250
University Hospital[1]	Baltimore	T. E. Woodward	.....	...	2	3	2	75
Suburban Hospital[1 3]	Bethesda, Md.	W. T. Joyce	8,134	129	3	6	2	175
New England Hospital[1-3]	Boston	R. A. Draper	.....	...	2	4	2	85
St. Anne's Hospital[3]	Fall River, Mass.	J. C. Corrigan	6,220	66	4	4	1	200
Worcester City Hospital[1-3]	Worcester, Mass.	J. A. Lundy	.....	...	4	6	2	215
Oakwood Hospital[1-3]	Dearborn, Mich.	S. M. Gillespie	6,693	43	4	8	2	250
Brent General Hospital[1-3]	Detroit	C. Rottenberg	7,108	54	3	6	2	450
Evangelical Deaconess Hospital[1-3]	Detroit	W P. Curtiss	721	9	1	2	2	307
Henry Ford Hospital[1-3]	Detroit	J. G. Mateer	Incl. in Int. Med.		2	4	2	250
Lynn Hospital[1-3]	Detroit	E. W. Erickson	3,492	24	6	12	2	500
North Detroit General Hospital[1-3]	Detroit	B L. Lieberman	4,424	26	3	5	2	425
Hurley Hospital[1-3]	Flint, Mich.	J. S. Schultz	.....	...	2	2	1	325
McLaren General Hospital[1]	Flint, Mich.	G. C. Campbell	3,314	39	3	6	2	350
St. Joseph Hospital	Flint, Mich.	J. Benson	16,126	205	..	..	2	...
Borgess Hospital[1]	Kalamazoo, Mich.	F. M. Doyle	5,298	122	2	4	2	275
St. Joseph Mercy Hospital[1-3]	Pontiac, Mich.	H. Arnkoff	.....	...	4	4	2	325
St. Mary's Hospital	Saginaw, Mich.	T. E. Fleschner	5,423	77	1	2	2	400
James Decker Munson Hospital[1]	Traverse City, Mich.	G. E. Stokes	.....	...	1	2	2	300
Wyandotte General Hospital[1]	Wyandotte, Mich.	R J. Deering	10,763	106	8	8	2	400
Fairview Hospital[1-3]	Minneapolis	L F. Sherman	2,620	150	5	10	2	300
Lutheran Deaconess Home and Hospital[1-3]	Minneapolis	B. Cohen	8,592	85	2	3	2	200
Midway Hospital[3]	St. Paul	A. E. Ritt	6,103	88	..	4	2	300
St. Luke's Hospital	St. Paul	R. C. Knutson- C. J. Mishek	7,628	67	4	8	2	200
Mississippi Baptist Hospital[1-3]	Jackson, Miss.	W. E. Lotterhos	2,931	17	1	1	2	250
University Hospital[1]	Jackson, Miss.	L. F. Rittelmeyer	8,202	276	2	4	2	250
Mercy Hospital-Street Memorial[1-3-218]	Vicksburg, Miss.	T. H. Mitchell	.....	20	1	2	1	275
University of Missouri Medical Center[1-3]	Columbia, Mo.	R. L. Pullen	Incl. in Int. Med.		1	2	2	200
Menorah Medical Center[1-3]	Kansas City, Mo.	L. M. Shapiro	.....	...	2	3	2	200
Missouri Methodist Hospital[1-3]	St. Joseph, Mo.	O. W. D. Craig	4,280	57	2	2	1	225
De Paul Hospital[1-3]	St. Louis	W. A. Spoeneman	.....	102	2	2	2	200
Lutheran Hospital[1-3]	St. Louis	E V. Henschel	6,876	105	..	4	2	200
St. Anthony's Hospital[1-3]	St. Louis	G. O'Sullivan	3,861	20	3	6	2	200
Immanuel Hospital[1-3]	Omaha, Neb.	C. M. Bonniwell	5,842	67	1	1	2	470
Hunterdon Medical Center[1-3]	Flemington, N. J.	E. D. Pellegrino	1,366	74	2	2	2	150
Mountainside Hospital[1-3]	Montclair, N. J.	F. H. Schurman	6,583	26	1	2	2	250
Princeton Hospital[1-3]	Princeton, N. J.	B. B. Scassorra	6,334	...	5	5	2	300
Somerset Hospital	Somersville, N. J.	M. E. Tolomeo	10,542	95	1	1	2	225
Overlook Hospital[1-3]	Summit, N. J.	L. J. Anson	11,316	154	1	2	1	200
Mercy Hospital	Buffalo	C. F. Banas	16,524	198	3	6	1	250
Millard Fillmore Hospital[1-3]	Buffalo	M. Cheplove	1,350	...	2	3	2	285

Numerical and other references will be found on pages 640 through 642.

7. GENERAL PRACTICE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered*	Total Residencies Offered*	Length of Approved Program (Years)	Beginning Stipend (Month)
Community Hospital at Glen Cove [1-3]	Glen Cove, N. Y.	R. Parker	8,663	107	2	2	2	300
Kingston Hospital	Kingston, N. Y.	H. L. Rakov	5,444	85	2	3	2	300
Our Lady of Victory Hospital [3]	Lackawanna, N. Y.	T. F. Barrett	9,284	72	2	2	1	175
St. Mary's Hospital [1-3]	Rochester, N. Y.	C. Noonan	4,312	170	1	2	2	220
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	J. Sessions	.....	...	7	7	2	175
Mercy Hospital [1-3]	Charlotte, N. C.	E. L. Potter	3,732	35	4	4	2	265
City Memorial Hospital [1-3]	Winston-Salem, N. C.	.....	.....	...	1	2	2	300
Akron City Hospital [1-3]	Akron, Ohio	D. J. Roberts	22,195	...	2	4	2	250
Akron General Hospital [1]	Akron, Ohio	H. A. Karam	.....	...	4	9	3	250
St. Thomas Hospital [1-3]	Akron, Ohio	M. F. Bossart	.....	...	2	4	2	250
Barberton Citizens Hospital [1-3]	Barberton, Ohio	A. Brown	10,072	109	3	6	2	350
Mercy Hospital [1-3]	Canton, Ohio	J. G. Hendershot	1,923	33	1	1	2	200
Christ Hospital [1]	Cincinnati	J. L. Lindner	.....	...	4	8	2	200
Good Samaritan Hospital [1-3]	Cincinnati	J. D. Marioni	Incl. in Int. Med.		4	4	2	250
Fairview Park Hospital [1-3]	Cleveland	R. S. Maurer	.....	...	2	4	2	200
Polyclinic Hospital	Cleveland	J. R. Heller	.....	...	4	7	2	300
Woman's Hospital [1-3]	Cleveland	P. Coppedge	6,166	42	4	8	2	175
Mount Carmel Hospital [1-3]	Columbus, Ohio	J. H. Henry	1,045	48	3	3	2	275
St. Anthony's Hospital [1-3]	Columbus, Ohio	W. W. Wiltberger	1,546	39	3	6	2	265
White Cross Hospital [1-3]	Columbus, Ohio	W. P. Smith, Jr.	1,750	33	1	1	1	290
Good Samaritan Hospital [1-3]	Dayton, Ohio	R. M. Kahn	15,233	96	2	4	2	270
Miami Valley Hospital [1-3]	Dayton, Ohio	D. L. Hirst	.....	...	4	4	1	200
Elyria Memorial Hospital [1-3]	Elyria, Ohio	J. Wherry	1,331	17	3	5	2	270
Euclid-Glenville Hospital [1-3]	Euclid, Ohio	J. B. Price	8,300	86	9	12	2	200
Lima Memorial Hospital [1-3]	Lima, Ohio	E. Murray	6,929	107	4	5	1	275
St. Rita's Hospital [1-3]	Lima, Ohio	J. A. Glorioso	3,360	45	1	2	2	400
Ohio Valley Hospital [3]	Steubenville, Ohio	C. F. Goll	10,289	93	1	2	2	300
Mercy Hospital [1-3]	Toledo, Ohio	J. C. Fries	1,540	49	1	2	2	275
St. Charles Hospital [1-3]	Toledo, Ohio	J. S. Kozy	.....	...	2	4	2	275
St. Vincent's Hospital [1-3]	Toledo, Ohio	M. A. Schnitker	.....	...	1	2	2	325
Toledo Hospital [1-3]	Toledo, Ohio	J. L. Kobacker	3,725	53	1	2	2	275
St. Joseph's Riverside Hospital [1-3]	Warren, Ohio	L. A. Loria	.....	...	4	7	2	300
Youngstown Hospital [1-3]	Youngstown, Ohio	J. L. Fisher	7,831	142	1	2	2	325
University of Oklahoma Hospitals [1-3-325]	Oklahoma City	I. H. Brown	.....	...	8	8	2	275
St. Vincent's Hospital [1-3]	Portland, Ore.	G. T. Harpole	.....	...	2	4	2	275
Altoona Hospital [1-3]	Altoona, Pa.	R. S. Magee	2,108	61	1	3	2	325
St. Luke's Hospital [1-3]	Bethlehem, Pa.	P. Budura	.....	...	1	1	1	225
Chester Hospital [1]	Chester, Pa.	H. Gold	11,840	186	2	4	2	350
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	J. A. Collins	.....	...	1	2	2	175
Thomas M. Fitzgerald Mercy Hospital	Darby, Pa.	E. G. Torrance	12,193	114	1	1	1	200
Montgomery Hospital	Norristown, Pa.	S. C. Carfagno	8,329	98	2	2	1	400
Sacred Heart Hospital [1-3]	Norristown, Pa.	J. C. McLoone	2,851	54	6	6	1	350
St. Mary's Hospital [3]	Philadelphia	J. Daly	7,903	75	4	8	2	250
St. Clair Memorial Hospital [1]	Pittsburgh	I. L. Kaufman	5,066	35	2	3	2	300
A. C. Milliken Hospital [3]	Pottsville, Pa.	N. M. Wall	5,559	69	3	6	2	400
Community General Hospital [1-3]	Reading, Pa.	C. S. Kring	7,741	94	2	2	2	300
Newport Hospital [1-3]	Newport, R. I.	A. M. Tartaglino	1,914	...	1	1	2	150
Memorial Hospital [1-3]	Pawtucket, R. I.	E. J. Mara	Incl. in Int. Med.		2	4	2	250
Woonsocket Hospital [1-3]	Woonsocket, R. I.	H. J. Gauthier	6,401	94	3	6	2	260
Greenville General Hospital [1]	Greenville, S. C.	W. H. Thames	7,129	150	2	3	2	250
Spartanburg General Hospital [1]	Spartanburg, S. C.	L. W. Luttrell	18,827	110	3	3	2	200
Sioux Valley Hospital [1-3]	Sioux Falls, S. Dak.	E. E. Greenough	9,739	122	1	2	2	200
Sacred Heart Hospital [1-3]	Yankton, S. Dak.	R. F. Thompson	4,929	85	4	4	2	300
St. Mary's Memorial Hospital [1-3]	Knoxville, Tenn.	J. Raulston	13,007	98	1	2	2	250
University of Tennessee Memorial Research Center and Hospital [1-3]	Knoxville, Tenn.	J. H. Burkhart	11,981	...	2	4	2	320
Baptist Hospital [1-3]	Nashville, Tenn.	J. P. Lindsay	1,621	...	3	3	1	300
All Saints Hospital [1-3]	Fort Worth, Texas	E. Davenport	6,727	46	4	4	1	250
St. Mary's Infirmary [1]	Galveston, Texas	M. L. Ross	7,923	74	4	8	2	400
Memorial Hospital [1-3]	Houston, Texas	P. J. Cecala	19,676	155	6	12	2	220
Nan Travis Memorial Hospital [1-3]	Jacksonville, Texas	J. M. Travis	5,473	30	1	2	2	250
Baptist Memorial Hospital [1-3]	San Antonio, Texas	L. B. Jones	9,649	146	1	2	2	150
Robert B. Green Memorial Hospital [1-3]	San Antonio, Texas	L. B. Reppert	.....	...	1	2	2	150
Santa Rosa Hospital [1-3]	San Antonio, Texas	E. L. Mueller, Sr.	.....	...	1	2	2	250
Wichita General Hospital [1-3]	Wichita Falls, Texas	J. B. Hathorn	10,489	63	3	3	1	300
St. Benedict's Hospital [1-3]	Ogden, Utah	L. D. Nelson	7,207	87	4	4	1	250
Thomas D. Dee Memorial Hospital [1]	Ogden, Utah	G. F. Kearns	12,820	197	3	5	2	325
De Goesbriand Memorial Hospital	Burlington, Vt.	J. Lantman- A. B. Lawrence	.....	...	1	2	2	167
Riverside Hospital [1-3]	Newport News, Va.	M. L. Horne	Incl. in Int. Med.		6	6	2	250
De Paul Hospital [1-3]	Norfolk, Va.	I. Hancock	.....	...	1	2	2	200
Norfolk Community Hospital [1-3]	Norfolk, Va.	G. H. Francis	3,343	46	2	4	2	300
Norfolk General Hospital [1-3]	Norfolk, Va.	G. H. Rector	Incl. in Int. Med.		4	4	2	215
Louise Obici Memorial Hospital [1-3]	Suffolk, Va.	A. H. Taylor	5,540	60	4	4	2	250
Providence Hospital [1-3]	Seattle	M. J. Buckley	.....	..	4	4	1	215
Sacred Heart Hospital [3]	Spokane, Wash.	E. B. Saxon	26,305	267	2	4	1	250
St. Luke's Hospital	Spokane, Wash.	D. E. Babcock	.....	...	2	2	2	225
Bluefield Sanitarium [3]	Bluefield, W. Va.	J. R. Shanklin	2,253	28	4	4	1	400
Charleston General Hospital [1-3]	Charleston, W. Va.	M. Barber	Incl. in Int. Med.		2	2	2	225
Memorial Hospital [1-3]	Charleston, W. Va.	J. W. Hash	.....	..	1	1	1	250
Cabell Huntington Hospital [1-3]	Huntington, W. Va.	F. M. Booth	Incl. in Int. Med.		2	2	2	250
Camden Clark Memorial Hospital [1-3]	Parkersburg, W. Va.	W. R. Yeager	8,069	63	1	2	2	200
St. Joseph's Hospital [3]	Parkersburg, W. Va.	L. W. Hovis	8,761	78	1	1	2	300
Ohio Valley General Hospital [1-3]	Wheeling, W. Va.	G. L. Armbrecht	3,177	28	2	4	2	300
Luther Hospital [1-3]	Eau Claire, Wis.	R. R. Richards	9,487	127	2	2	1	300
Evangelical Deaconess Hospital [1-3]	Milwaukee	A. H. Hermann	6,096	105	2	3	2	250
Milwaukee County Hospital [1-3]	Milwaukee	W. W. Engstrom- J. M. King	.....	...	2	4	2	207
Milwaukee Hospital [1-3]	Milwaukee	E. R. Daniels	.....	...	1	1	1	270
St. Luke's Hospital [1-3]	Milwaukee	M. Landsberg	4,358	50	1	2	2	275
St. Michael Hospital [3]	Milwaukee	E. Kay	.....	...	3	6	2	275
Arecibo District Hospital [1]	Arecibo, P. R.	M. de J. Gonzalez	.....	...	4	6	2	250
Hospital Auxillio Mutuo [1]	Hato Rey, P. P.	F. H. Morales	.....	...	..	..	2	250

Numerical and other references will be found on pages 640 through 642.

8. INTERNAL MEDICINE

Residency programs in the following hospitals have been approved by the Council, the Am[illegible] Board of Internal Medicine, and the American College of Physicians through the Resid[illegible] for Internal Medicine, as offering acceptable training in the specialty under any [illegible] leading to eligibility for examination by the American Board of I[illegible].

Hospitals, 586; Assistant Residencies and Residencies, 5,535

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[8]	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES AIR FORCE								
U. S. Air Force Hospital	San Antonio, Texas	P. G. Keil	5,931	20	5	15	3	...
UNITED STATES ARMY								
Letterman Army Hospital [1-3]	San Francisco	F. H. Mowrey	1,614	52	5	16	3	...
Fitzsimons Army Hospital [1-3]	Denver	G. M. Powell	1,750	25	3	10	3	...
Army Medical Center [1-3]	Washington, D. C.	T. W. Mattingly	969	58	8	25	3	...
William Beaumont Army Hospital [3]	El Paso, Texas	R. C. Hunter, Jr.	7,748	80	3	9	3	...
Brooke Army Hospital [1-3]	San Antonio, Texas	D. J. Sheehan	3,530	133	7	22	3	...
Madigan Army Hospital [1-3]	Tacoma, Wash.	W. C. Berry	2,492	27	2	2	1	...
Tripler Army Hospital [1-3]	Honolulu, T. H.	A. A. Biederman	4,955	57	5	15	3	...
UNITED STATES NAVY								
U. S. Naval Hospital [1-3-25]	Oakland, Calif.	R. O. Canada, Jr.	3,256	51	5	12	3	...
U. S. Naval Hospital [1]	San Diego, Calif.	J. E. Gorman	1,733	69	5	15	3	...
U. S. Naval Hospital [1-3]	Great Lakes, Ill.	G. M. Davis	3,573	23	..	1	2	...
U. S. Naval Hospital [1-3]	Bethesda, Md.	J. B. MacGregor	773	...	4	11	3	...
U. S. Naval Hospital [1-3]	Chelsea, Mass.	H. L. Jones, Jr.	2,258	20	2	4	3	...
U. S. Naval Hospital [1]	St. Albans, N. Y.	G. L. Calvy	1,598	18	4	8	3	...
U. S. Naval Hospital [1-3]	Philadelphia	J. S. Cowan	2,658	84	6	12	3	...
U. S. Naval Hospital [1-3]	Portsmouth, Va.	R. J. Whipple	4,546	20	4	6	3	...
UNITED STATES PUBLIC HEALTH SERVICE								
U. S. Public Health Service Hospital [1-3]	San Francisco	R. H. Linn	2,159	34	2	6	3	...
U. S. Public Health Service Hospital [1-3]	New Orleans	J. K. Irion	2,784	35	1	4	3	...
U. S. Public Health Service Hospital [1-3]	Baltimore	G. F. Ellinger	1,782	33	2	6	3	...
National Institutes of Health Clinical Center [1-3]	Bethesda, Md.	L. Terry	751	43	..	12	1	...
U. S. Public Health Service Hospital [1-3]	Boston	D. J. Tenenberg	1,436	30	1	3	3	...
U. S. Public Health Service Hospital [1-3]	Stapleton, S. I., N. Y.	C. G. Spicknall	2,774	83	3	9	3	...
U. S. Public Health Service Hospital [1-3]	Seattle	W. H. Stimson	1,771	38	1	3	3	...
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE								
Freedmen's Hospital [1-3]	Washington, D. C.	J. B. Johnson	1,280	88	4	14	3	308
NONFEDERAL AND VETERANS ADMINISTRATION								
Carraway Methodist Hospital [1]	Birmingham, Ala.	E. D. Lineberry—O. C. McCarn	2,399	47	1	1	3	250
University of Alabama Medical Center			.....	...	..	..	3	...
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.		5,597	183	12	26	..	108
Veterans Admin. Hospital [1-3]	Birmingham, Ala.		571	43	3	7	..	...
Lloyd Noland Hospital [1-3]	Fairfield, Ala.	C. E. Porter	3,109	69	2	6	3	250
Mobile County Hospital [1-3]	Mobile, Ala.	W. J. Atkinson	1,812	98	1	2	1	275
Veterans Admin. Hospital [1]	Tuskegee, Ala.	E. T. Odom	1,931	53	3	8	3	...
Maricopa County General Hospital [1-3]	Phoenix, Ariz.	M. H. Green	951	66	2	6	3	300
St. Joseph's Hospital [1-3]	Phoenix, Ariz.	B. Frissell	2,002	61	1	3	3	250
St. Mary's Hospital [1-3]	Tucson, Ariz.	C. A. Stephens	5,004	122	3	3	1	200
Tucson Medical Center [1-3]	Tucson, Ariz.	R. V. Murphy	4,621	132	2	2	1	200
Universit[illegible] [1-3]	Little Rock, Ark.	R. V. Ebert	1,117	61	6	18	3	155
Veterans [illegible]	Little Rock, Ark.	H. R. Hipp	3,493	118	3	5	3	...
[illegible] County [1] General [illegible]	Arlington, Calif.		1,677	129	1	1	1	533
Kern County General Hospital [1]	Bakersfield, Calif.	C. Stilgenbauer	1,380	161	4	8	3	325
Herrick Memorial Hospital [1-3]	Berkeley, Calif.	H. I. Harvey	2,429	89	1	3	3	175
City of Hope Medical Center [1-3]	Duarte, Calif.	H. R. Bierman	292	55	1	3	1	400
San Joaquin General Hospital [1]	French Camp, Calif.	L. Armanino	2,084	221	3	6	3	260
General Hospital of Fresno County [1-3]	Fresno, Calif.	B. R. Packer	2,440	133	2	6	3	300
Glendale Sanitarium and Hospital [1]	Glendale, Calif.	D. L. John	4,817	154	1	3	3	325
Scripps Clinic and Research Foundation [1-3]	La Jolla, Calif.	E. L. Keeney	2,116	26	2	6	1	415
Seaside Memorial Hospital [1-3]	Long Beach, Calif.	A. H. Ruell	4,961	118	1	3	3	185
Veterans Admin. Hospital [1-3-55]	Long Beach, Calif.	D. W. Leik	2,431	263	6	18	3	...
Cedars of Lebanon Hospital [1-3]	Los Angeles	J. Reynolds—L. Gunther	2,449	79	4	10	3	265
Hospital of the Good Samaritan [1-3]	Los Angeles	J. L. Reynolds	3,368	65	2	6	3	250
Los Angeles County Hospital [1]	Los Angeles	W. Graf	16,067	907	18	48	3	216
Presbyterian Hospital—Olmsted Memorial [1-3]	Los Angeles	L. M. Waller	2,652	40	2	2	1	200
Queen of Angels Hospital [1-3]	Los Angeles	R. Bretchner	3,218	136	1	2	1	200
St. Vincent's Hospital [1-3]	Los Angeles	E. W. Boland	3,680	69	1	2	1	350
University of California Hospital [1-3]	Los Angeles	J. S. Lawrence	1,772	97	6	12	3	229
Veterans Admin. Hospital [1-3]	Los Angeles	L. Fred	5,269	382	20	54	3	...
White Memorial Hospital [1-3]	Los Angeles	V. J. Johns, Jr.	1,748	90	2	5	3	215
Highland-Alameda County Hospital [1-3-71]	Oakland, Calif.	K. W. Benson	5,701	292	4	12	3	200
Kaiser Foundation Hospital [1-3]	Oakland, Calif.	P. J. Raimondi	2,004	92	6	9	3	315
Veterans Admin. Hospital [1-3]	Oakland, Calif.	E. R. Movitt	6,163	371	3	9	3	...
Orange County General Hospital [1-3]	Orange, Calif.	R. W. Oppell—G. F. Warner	3,576	135	1	4	3	335
Collis P. and Howard Huntington Memorial Hospital [1-3]	Pasadena, Calif.	R. M. Shelton	2,430	112	1	3	3	200
San Bernardino County Charity Hospital	San Bernardino, Calif.	W. L. Cover	1,521	177	4	4	1	193
Mercy Hospital [1-3]	San Diego, Calif.	E. M. Fetter	2,542	85	1	3	3	225
San Diego County General Hospital [1-3]	San Diego, Calif.	A. M. Bassett	1,973	149	4	7	3	250
Children's Hospital [1-3]	San Francisco	P. M. Aggeler	1,165	40	2	5	2	175
Franklin Hospital [1]	San Francisco	D. Gorman	1,845	25	1	3	1	400
French Hospital [1-3]	San Francisco	D. L. Wilbur	1,977	60	3	4	2	200
Kaiser Foundation Hospital [1-3]	San Francisco	C. C. Herbert	1,249	112	4	12	3	200
Mary's Help Hospital [1-3]	San Francisco	F. Rochex	1,516	56	1	2	1	200

Numerical and other references will be found on pages 640 through 642.

8. INTERNAL MEDICINE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [a]	Total Residencies Offered [a]	Length of Approved Program (Years)	Beginning Stipend (Month)
Mount Zion Hospital [1-2]	San Francisco	J. J. Sampson	3,967	126	3	6	3	150
St. Joseph's Hospital [1-2]	San Francisco	M. E. Leonard	2,262	46	1	1	1	300
St. Luke's Hospital [1-3]	San Francisco	E. Bruck	2,797	69	2	4	3	325
St. Mary's Hospital [1-2]	San Francisco	J. J. McGinnis	2,321	55	2	5	3	200
San Francisco Hospital								
Stanford University Service [1]	San Francisco	J. K. Lewis	2,530	133	5	6	3	205
University of California Service [1]	San Francisco	I. S. Edelman	2,487	218	5	7	3	205
Southern Pacific General Hospital [1-2]	San Francisco	R. E. Allen	4,014	170	2	5	3	175
Stanford University Hospitals [1-3-76]	San Francisco	D. A. Rytand	2,021	122	9	15	3	100
University of California Hospitals [2-78]	San Francisco	H. D. Brainerd	2,717	134	9	29	3	231
Veterans Admin. Hospital [1-3]	San Francisco	F. M. Willett	1,384	117	13	22	2	...
Santa Clara County Hospital [1-2]	San Jose, Calif.	J. M. Stone	1,384	209	2	5	3	260
Community Hospital of San Mateo County [1]	San Mateo, Calif.	W. F. Knorp	1,073	83	2	5	2	200
Santa Barbara Cottage Hospital [1-3-89]	Santa Barbara, Calif.	T. K. Hill	2,194	78	3	6	3	200
Veterans Admin. Hospital [1-2]	Sepulveda, Calif.	R. Goldman	767	105	4	4	1	...
Harbor General Hospital [1-91]	Torrance, Calif.	E. M. Duvall-F. Kellogg	4,151	282	8	24	3	246
Mercy Hospital [1-3]	Denver	A. W. Mutz	4,139	86	1	1	1	225
Presbyterian Hospital [1-2-93]	Denver	H. A. Bradford	1,673	73	1	3	2	225
St. Joseph's Hospital [1-2]	Denver	W. B. Yegge	3,375	61	3	6	3	260
St. Luke's Hospital [1]	Denver	M. G. Nims	3,658	171	1	1	2	225
University of Colorado Medical Center		G. Meiklejohn	.....	...	..	..	3	...
Colorado General Hospital [1-2]	Denver		1,428	158	8	34	..	180
Denver General Hospital [1-3]	Denver		2,909	251	..	..	..	179
Veterans Admin. Hospital [1-2-94]	Denver	T. P. Sears	2,315	146	6	17	3	...
Colorado State Hospital [1-2-95]	Pueblo, Colo.	G. R. Curless	2,593	167	6	12	2	415
St. Mary-Corwin Hospital [1-2]	Pueblo, Colo.	R. H. Finney	3,872	51	2	2	1	285
Bridgeport Hospital [1-2]	Bridgeport, Conn.	D. B. Hardenbergh	3,099	97	2	4	2	240
St. Vincent's Hospital [1-2]	Bridgeport, Conn.	V. Lynch	3,089	95	1	3	3	300
Greenwich Hospital [1-2]	Greenwich, Conn.	J. Lockwood	2,153	114	1	2	2	150
Hartford Hospital [1-2-101]	Hartford, Conn.	M. O. Phelps	4,953	268	16	24	3	125
Hartford Municipal Hospital and Health Center [1-3]	Hartford, Conn.	S. Donner	931	70	1	3	2	255
St. Francis Hospital [1-3]	Hartford, Conn.	J. J. Moher	3,597	127	2	5	3	175
New Britain General Hospital [1-2]	New Britain, Conn.	J. C. White	2,642	133	1	3	3	210
Grace-New Haven Community Hospital [1-3-108]	New Haven, Conn.	P. B. Beeson-T. S. Evans	3,897	294	8	18	3	140
Hospital of St. Raphael [109]	New Haven, Conn.	T. S. Evans	2,261	91	4	8	3	150
Veterans Admin. Hospital [1-2]	Newington, Conn.	P. Lipton	1,306	71	3	5	3	...
Lawrence and Memorial Hospitals [1-2]	New London, Conn.	E. Gipstein	2,878	95	3	3	1	250
St. Mary's Hospital [1-3]	Waterbury, Conn.	M. Coshak	2,887	86	2	5	3	225
Waterbury Hospital [1]	Waterbury, Conn.	O. J. Bizzozero	3,647	107	1	3	3	225
Veterans Admin. Hospital [1-2]	West Haven, Conn.	J. W. Hollingsworth	864	62	2	3	3	...
Delaware Hospital [1-2]	Wilmington, Del.	L. B. Flinn	2,331	157	2	5	3	220
Memorial Hospital [1-2]	Wilmington, Del.	L. P. Lang	2,557	130	1	3	3	225
Wilmington General Hospital [1-2]	Wilmington, Del.	J. R. Durham, Jr.	1,599	43	2	2	1	260
District of Columbia General Hospital [1-2]	Washington, D. C.	H. H. Hussey-M. J. Roman	5,297	435	20	26	3	233
Georgetown University Hospital [1-3]	Washington, D. C.	H. H. Hussey	2,839	164	8	21	3	175
George Washington University Hospital [1-2]	Washington, D. C.	T. M. Brown	4,834	189	3	8	3	150
Providence Hospital [2]	Washington, D. C.	T. F. Collins	2,022	67	2	5	3	350
Veterans Admin. Hospital [1-3-115]	Washington, D. C.	E. D. Freis	2,384	130	5	15	3	...
Washington Hospital Center [1-2]	Washington, D. C.	T. J. Abernethy	5,348	208	4	10	3	215
Veterans Admin. Hospital [1-2]	Coral Gables, Fla.	J. M. Rumball	2,508	261	9	17	3	...
Duval Medical Center [1-3]	Jacksonville, Fla.	K. B. Hanson	1,753	144	3	6	3	150
Riverside Hospital	Jacksonville, Fla.	D. White	1,081	15	1	1	1	200
St Luke's Hospital [1-2]	Jacksonville, Fla.	J. M. Borland	2,345	36	1	1	1	300
St. Vincent's Hospital [2]	Jacksonville, Fla.	*L. E. Geeslin*	2,700	56	2	4	1	225
Jackson Memorial Hospital [1-2]	Miami, Fla.	R. Jones, Jr.	3,343	319	10	34	3	75
Mount Sinai Hospital of Greater Miami [1-3]	Miami Beach, Fla.	D. A. Nathan	4,305	149	4	10	3	250
St. Francis Hospital [1-2]	Miami Beach, Fla.	D. G. Stannus	3,324	58	2	2	2	215
Orange Memorial Hospital [1]	Orlando, Fla.	W. D. Steward	2,935	78	1	3	1	325
Tampa General Hospital [1]	Tampa, Fla.	K. Gould	5,550	106	1	3	3	250
Crawford W. Long Memorial Hospital [1-3]	Atlanta, Ga.	L. H. Bishop, Jr.	3,570	57	4	7	3	285
Georgia Baptist Hospital [1]	Atlanta, Ga.	M. Johnson	4,002	118	3	6	3	305
Grady Memorial Hospital [1]	Atlanta, Ga.	J. W. Hurst	2,013	304	10	19	3	160
Piedmont Hospital [1-2]	Atlanta, Ga.	C. Smith	1,587	29	1	3	3	290
St. Joseph's Infirmary [1-2]	Atlanta, Ga.	T. T. Blalock	3,239	30	1	3	3	270
Veterans Admin. Hospital [1-3]	Atlanta, Ga.	J. C. Crutcher	1,722	119	7	15	3	...
Medical College of Georgia Hospitals			.....	...	..	..	3	...
Eugene Talmadge Memorial Hospital [1-2]	Augusta, Ga.	T. Findley	891	58	6	19	..	250
University Hospital [1]	Augusta, Ga.	J. D. Gray	1,953	79	1	3	..	200
Veterans Admin. Hospital [1-3]	Augusta, Ga.	J. G. Bohorfoush	1,321	53	..	1	..	...
Emory University Hospital [1-3]	Emory University, Ga.	R. B. Logue	3,393	87	6	14	3	235
Memorial Hospital of Chatham County [1-3]	Savannah, Ga.	F. T. Nichols, Jr.	1,595	81	1	3	1	350
Augustana Hospital [1-2]	Chicago	C. A. Hedberg	4,478	118	3	3	1	150
Columbus Hospital [2]	Chicago	E. Foley	.....	111	2	6	2	100
Cook County Hospital	Chicago	E. F. Foley	15,238	650	14	40	3	140
Grant Hospital [1-2]	Chicago	A. Vander Kloot	3,425	116	1	2	2	225
Illinois Central Hospital [1-2]	Chicago	W. J. Hand	3,468	88	3	3	2	252
Illinois Masonic Hospital [1-3]	Chicago	L. L. Braun	1,590	56	3	5	2	115
Mercy Hospital [1-2]	Chicago	G. F. O'Brien	2,047	57	4	9	3	200
Michael Reese Hospital [1-2]	Chicago	R. Levine	3,962	183	5	15	3	125
Mount Sinai Hospital [1-2-5]	Chicago	H. Zimmerman	3,238	126	4	13	3	225
Northwestern University Medical Center [6]								
Chicago Wesley Memorial Hospital [1-2]	Chicago	P. S. Rhoads	4,894	155	4	8	3	125
Passavant Memorial Hospital [1-3]	Chicago	H. Alt	2,678	63	1	4	3	125
Veterans Admin. Research Hospital [1-3-133]	Chicago	C. Borden	1,104	35	12	26	3	...
Evanston Hospital [1-2]	Evanston, Ill.	L. F. Jourdonais	3,674	164	2	6	3	225
Norwegian American Hospital	Chicago	M. P. Gethner	1,684	44	2	2	1	200
Presbyterian-St. Luke's Hospital								
Presbyterian Hospital Division [1-3]	Chicago	J. A. Campbell	4,190	149	6	18	3	125
St. Luke's Hospital Division [1-3]	Chicago	T. J. Coogan	3,783	135	4	12	3	125
Provident Hospital [1-2]	Chicago	A. F. Connor	1,105	38	1	2	1	200
St. Joseph Hospital [1-3]	Chicago	D. L. Kessler	1,758	69	2	2	1	300
St. Mary of Nazareth Hospital [1-2]	Chicago	S. A. Motto	2,417	98	2	2	1	200

Numerical and other references will be found on pages 640 through 642.

8. INTERNAL MEDICINE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
University of Chicago Clinics [1-3]	Chicago	W. Adams	4,874	197	8	24	3	200
University of Illinois Research and Educational Hospitals [1-3]	Chicago	H. F. Dowling	1,165	115	5	14	3	140
Veterans Admin. West Side Hospital [1-3-133]	Chicago	R. D. Eckhardt	1,984	162	5	12	3	...
St. Francis Hospital [1]	Evanston, Ill.	J. T. Paul	2,949	171	2	5	3	210
Veterans Admin. Hospital [1-3-137]	Hines, Ill.	L. A. Baker	3,250	112	16	45	3	...
St. Francis Hospital	Peoria, Ill.	R. B. Rutherford	4,940	132	1	3	3	225
[illegible]	Bluffton, Ind.	A. A. C. Nickel	4,336	45	1	3	3	300
[illegible] Hospital [1-3]	Indianapolis	P. J. Fouts	2,366	191	4	12	3	205
[illegible] Medical Center [1]	Indianapolis	G. Irwin	2,281	128	3	9	3	165
[illegible] [1]	Indianapolis	H. Van Vactor	4,130	133	2	6	3	278
St. Vincent's Hospital [1-3]	Indianapolis	J. O. Ritchey	900	25	1	3	3	275
Veterans Admin. Hospital [1-3]	Indianapolis	R. H. Behnke	2,535	173	4	5	3	...
St. Elizabeth Hospital [1-3]	Lafayette, Ind.	R. C. Bolin-B. Z. Klatch	1,971	18	2	2	1	275
Iowa Methodist Hospital [1-3]	Des Moines, Iowa	A. L. Jenks, Jr.	2,949	214	1	3	3	200
Veterans Admin. Hospital [1-3]	Des Moines, Iowa	J. C. Parsons	2,306	98	4	12	3	...
State University of Iowa Hospitals [1-3]	Iowa City	W. B. Bean	3,160	148	8	23	3	175
Veterans Admin. Hospital [1-3-30]	Iowa City	W. M. Kirkendall	1,703	104	6	14	3	...
University of Kansas Medical Center [1-3]	Kansas City, Kan.	E. G. Dimond	2,280	101	9	27	3	125
Veterans Admin. Hospital [1-3]	Kansas City, Mo.	C. E. Andrews	2,605	169	..	..	1	...
Veterans Admin. Hospital [1-3]	Topeka, Kan.	R. Chess	1,553	55	2	2	1	...
St. Francis Hospital [1-3]	Wichita, Kan.	C. T. Hagan	5,453	75	2	2	1	275
Wesley Hospital [1-3]	Wichita, Kan.	E. Crow	1,759	35	1	1	1	310
Harlan Memorial Hospital [1]	Harlan, Ky.	J. H. Willard	1,565	18	4	12	3	400
Good Samaritan Hospital [1-3]	Lexington, Ky.	J. Scott	3,545	56	1	1	1	225
St. Joseph Hospital [3]	Lexington, Ky.	J. W. Scott	2,061	41	1	3	1	230
Louisville General Hospital [1-3]	Louisville, Ky.	B. T. Towery	2,048	145	8	16	3	131
St [illegible] Infirmary [1-3]	Louisville, Ky.	F. Olash	4,246	77	1	3	1	210
Ve[illegible] [1-3-140]	Louisville, Ky.	J. R. Gott, Jr.	1,525	123	1	5	3	...
C[illegible] siana								
[illegible]	New Orleans	J. O. Weilbaecher, Jr.	1,471	114	3	9	3	100
[illegible] State University Unit [1]	New Orleans	W. R. Akenhead	3,155	258	6	18	3	100
[illegible] Unit [1]	New Orleans	G. E. Burch	3,220	243	6	18	3	100
[illegible] Hospital [1-3]	New Orleans	W. R. Arrowsmith	3,269	71	3	9	3	225
Southern Baptist Hospital [1]	New Orleans	J. W. Wells	4,518	88	1	3	1	225
Touro Infirmary [1]	New Orleans	A. Prieto	3,557	132	2	6	3	125
Veterans Admin. Hospital [1-3]	New Orleans	H. A. Buechner	2,418	183	6	16	3	...
Confederate Memorial Medical Center [1]	Shreveport, La.	M. D. Hargrove	5,859	148	3	9	3	125
Central Maine General Hospital [1]	Lewiston, Maine	M. A. Chapin	1,760	92	1	1	1	225
Maine Medical Center [1]	Portland, Maine	R. S. Hawkes	3,233	91	2	6	3	125
Baltimore City Hospitals [1-3]	Baltimore	G. S. Mirick	1,823	173	4	9	3	75
Church Home and Hospital [1-3]	Baltimore	Z. R. Morgan	1,335	61	2	5	3	200
Franklin Square Hospital [1-3]	Baltimore	L. M. Serra	1,612	92	4	5	2	225
Johns Hopkins Hospital [1-3]	Baltimore	A. M. Harvey	4,937	322	10	20	3	160
Lutheran Hospital [1-3]	Baltimore	L. A. M. Krause	1,605	60	4	8	3	220
Maryland General Hospital [1-3-161]	Baltimore	E. F. Cotter	1,529	95	3	6	3	225
Mercy Hospital [1-3]	Baltimore	H. R. Peters	1,934	102	2	5	3	275
St. Joseph's Hospital [3]	Baltimore	S. Morrison	1,539	68	2	2	1	225
Sinai Hospital [1-3]	Baltimore	A. I. Mendeloff	1,785	74	5	9	3	110
South Baltimore General Hospital [1-3]	Baltimore	....	2,319	53	2	3	1	150
Union Memorial Hospital [1-3]	Baltimore	J. E. Howard	2,296	110	4	..	3	215
University Hospital [1]	Baltimore	T. E. Woodward	3,629	210	13	21	3	75
Prince George's General Hospital [1-3]	Cheverly, Md.	W. B. Moyers	3,224	75	2	8	1	200
Veterans Admin. Hospital [1-3]	Fort Howard, Md.	I. Freeman	1,648	106	2	6	3	...
Veterans Admin. Hospital [1-3-161]	Perry Point, Md.	S. Goldgraben	1,026	17	1	2	3	...
Beth Israel Hospital [1-3]	Boston	H. L. Blumgart	3,146	139	..	14	3	167
Boston City Hospital [1-3]	Boston	....	.....	...	24	52	3	...
I and III Medical Service		F. Biguria	3,179	248	..	..	..	132
II and IV Medical Service		W. B. Castle	3,308	286	..	..	..	132
V and VI Medical Service		K. H. Katz	2,870	173	..	..	..	132
Carney Hospital [3-169]	Boston	F. L. Colpoys	3,151	82	4	9	3	175
Faulkner Hospital [1-3]	Boston	J. R. Graham	1,150	47	2	4	1	150
Lahey Clinic [1-3]	Boston	L. M. Hurxthal-F. N. Allan	5,385	38	10	30	3	200
Lemuel Shattuck Hospital [1-3-170]	Boston	T. C. Chalmers	853	103	8	14	3	262
Massachusetts General Hospital [1-3]	Boston	W. Bauer	6,960	...	7	20	3	67
Massachusetts Memorial Hospitals [1-3]	Boston	C. S. Keefer	1,763	80	5	21	3	175
New England Center Hospital [1-3]	Boston	S. Proger	5,514	48	5	41	3	160
New England Deaconess Hospital [1-3]	Boston	H. F. Root—C. C. Bailey	4,744	100	11	13	2	200
Peter Bent Brigham Hospital [1-3]	Boston	G. W. Thorn	3,035	241	6	20	3	83
Veterans Admin. Hospital [1-3]	West Roxbury, Mass.	T. A. Warthin	1,053	62	4	9	..	...
St. Elizabeth's Hospital [1-3-180]	Boston	J. Rattigan	2,608	87	2	6	3	125
Veterans Admin. Hospital [1-3]	Boston (Jamaica Plain)	M. B. Strauss	6,012	278	14	30	3	...
Cambridge City Hospital [1-3]	Cambridge, Mass.	E. E. Hinton	1,361	62	2	4	2	160
Mount Auburn Hospital [1-3]	Cambridge, Mass.	D. Hurwitz	1,846	89	1	3	2	155
Lawrence F. Quigley Memorial Hospital [1-3-187]	Chelsea, Mass.	W. R. Ohler	851	40	..	2	3	235
Malden Hospital [1-3]	Malden, Mass.	E. G. Thorp	2,012	59	2	3	1	200
Newton-Wellesley Hospital [1-3]	Newton Lower Falls, Mass.	A. W. Locke	2,059	109	1	3	3	200
Quincy Hospital [1-3]	Quincy, Mass.	J. C. Brudno	1,175	64	1	2	1	179
Salem Hospital [1-3]	Salem, Mass.	S. N. Gardner	1,483	35	1	1	1	200
Pondville Hospital	Walpole, Mass.	D. Merrill	.....	...	..	1	1	327
Memorial Hospital [1-3]	Worcester, Mass.	R. W. Robinson	2,749	94	1	4	3	200
St. Vincent Hospital	Worcester, Mass.	J. T. Brosnan	3,641	107	4	7	3	175
Worcester City Hospital [1-3]	Worcester, Mass.	J. Landy	2,510	155	2	5	3	215
St. Joseph Mercy Hospital [1-3]	Ann Arbor, Mich.	M. Marshall	4,073	96	4	7	3	310
University Hospital [1-3-101]	Ann Arbor, Mich.	P. S. Barker	4,559	162	20	60	3	160
Veterans Admin. Hospital [1-3-102]	Dearborn, Mich.	M. R. Weed	1,988	156	5	15	3	...
Alexander Blain Hospital [1-3]	Detroit	J. W. Kingsley, Jr.	1,121	22	1	2	2	325
Detroit Memorial Hospital [1-3-109]	Detroit	J. L. Cahalan	3,561	93	2	4	3	425
Evangelical Deaconess Hospital [1-3]	Detroit	L. D. Stern	1,809	83	2	2	1	307
Grace Hospital [1-3]	Detroit	D. W. Myers	5,667	163	3	9	3	275
Harper Hospital [1-3]	Detroit	R. J. Schneck	2,765	105	4	12	3	275

Numerical and other references will be found on pages 640 through 642.

8. INTERNAL MEDICINE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
Henry Ford Hospital [1-3]	Detroit	J. G. Mateer	9,730	414	28	78	3	250
Jennings Memorial Hospital [1-3]	Detroit	D. Donald	370	...	1	2	1	350
Mount Carmel Mercy Hospital [1-3]	Detroit	E. J. Tallant	4,795	170	4	12	3	275
Providence Hospital [1-3]	Detroit	L. J. Bailey	3,438	148	1	3	3	275
Receiving Hospital [1-3]	Detroit	M. Clapper	1,876	436	10	22	3	303
St. John Hospital [1-3]	Detroit	J. Murphy	1,888	36	1	3	3	325
St. Joseph Mercy Hospital [1]	Detroit	F. L. Strickroot	607	22	1	3	3	310
Sinai Hospital [1-3]	Detroit	J. E. Berk	2,586	66	3	9	3	275
Woman's Hospital [1]	Detroit	B. I. Johnstone	2,240	79	2	4	1	475
Wayne County General Hospital and Infirmary [1-3]	Eloise, Mich.	S. D. Jacobson	3,766	203	5	17	3	386
Hurley Hospital [1-3]	Flint, Mich.	G. E. Drewyer	6,088	163	2	6	3	325
McLaren General Hospital [1]	Flint, Mich.	H. V. Sparks	2,929	63	1	3	3	350
Blodgett Memorial Hospital [1-3]	Grand Rapids, Mich.	A. K. Hamp	2,375	126	1	3	3	300
Butterworth Hospital [1-3]	Grand Rapids, Mich.	W. Cayce	2,545	160	2	6	3	300
St. Mary's Hospital [1-3]	Grand Rapids, Mich.	R. H. Murray	2,200	104	2	2	1	275
Bon Secours Hospital [3]	Grosse Pointe, Mich.	R. Griffin	1,533	47	1	2	2	415
Highland Park General Hospital [1-3]	Highland Park, Mich.	L. Jaffe	1,185	93	1	3	3	308
Bronson Methodist Hospital [1]	Kalamazoo, Mich.	W. D. Harrelson	2,954	92	1	3	3	260
Edward W. Sparrow Hospital	Lansing, Mich.	F. C. Swartz	2,103	107	1	3	1	250
St. Lawrence Hospital [1-3-205]	Lansing, Mich.	J. F Cordes	3,037	125	3	9	3	350
Pontiac General Hospital [1-3]	Pontiac, Mich.	R. T. Lyons	3,835	88	2	5	2	325
St. Joseph Mercy Hospital [1-3]	Pontiac, Mich.	S. Miller	3,318	40	1	3	3	325
William Beaumont Hospital [1-3]	Royal Oak, Mich.	E. C. Rupp	2,264	72	2	4	3	300
Saginaw General Hospital [1-3]	Saginaw, Mich.	B. M. Bullington	1,843	68	1	3	3	365
Asbury Methodist Hospital [1-3]	Minneapolis	D. R. Hastings	2,453	64	1	1	1	200
Minneapolis General Hospital	Minneapolis	T. Lowry	1,814	154	4	10	3	220
Mount Sinai Hospital [1-3]	Minneapolis	W. Jacobson	1,989	80	1	2	3	200
Northwestern Hospital [1-3]	Minneapolis	M. C. L. Hanson	3,897	68	1	3	1	200
St. Barnabas Hospital [1-3]	Minneapolis	J. W. Johnson	3,235	95	2	2	1	235
University of Minnesota Affiliated Hospitals		....	....	...	..	..	3	...
University Hospital [1-3]	Minneapolis	C. J. Watson	2,131	211	5	16	..	233
Veterans Admin. Hospital [1-3-214]	Minneapolis	E. B. Flink	3,754	208	16	36	..	...
Ancker Hospital [1-3]	St. Paul	D. Gillespie	1,493	161	2	6	..	220
Mayo F[illegible]	Rochester, Minn.	R. D. Pruitt	24,012	253	60	187	3	175
Charles [illegible]	St. Paul	B. J. Mears	3,610	80	1	3	3	250
Universi[illegible]	Jackson, Miss.	J. R. Snavely	2,294	117	4	8	3	250
St. Louis County Hospital [1-3]	Clayton, Mo.	R. O. Muether	1,437	133	2	6	3	225
University of Missouri Medical Center [1-3]	Columbia, Mo.	C. T. Ray	666	25	3	7	3	200
Kansas City General Hospital No. 1 [1-3]	Kansas City, Mo.	T. R. Jones	2,317	182	4	12	3	200
Menorah Medical Center [1-3]	Kansas City, Mo.	H. Statland	4,116	75	3	7	3	300
St. Joseph Hospital [1-3]	Kansas City, Mo.	D. J. Cutcliff—A. Decker	2,687	75	1	3	1	250
St. Luke's Hospital [1-3]	Kansas City, Mo.	J. A. Jarvis	3,351	148	2	4	3	310
Barnes Hospital [1-3]	St. Louis	C. V. Moore	5,972	267	16	27	3	50
De Paul Hospital [1-3]	St. Louis	R. Potashnick	5,102	103	3	7	3	200
Homer G. Phillips Hospital [1-3]	St. Louis	J. R. Smith	3,306	279	9	20	3	201
Jewish Hospital [1-3]	St. Louis	A. Eisenstein	4,357	173	7	12	3	150
Missouri Baptist Hospital [1-3]	St. Louis	W. M. Lonergan	3,159	78	2	5	3	175
Missouri Pacific Hospital [3]	St. Louis	L. B. Harrison	4,717	112	6	9	3	200
St. John's Hospital [1-3]	St. Louis	A. McMahon	2,132	94	4	8	3	200
St. Louis City Hospital [1-3-223]	St. Louis	B. Bercu— R. Kinsella, Jr.	3,410	287	12	25	3	234
St. Luke's Hospital [1-3]	St. Louis	P. O. Hagemann	2,539	98	3	5	3	250
St. Mary's Group of Hospitals [1-3]	St. Louis	G. O. Broun	3,207	195	6	15	3	100
Veterans Admin. Hospital	St. Louis	....	...	...	..	..	3	...
St. Louis University Unit [1-3]		R. E. Mack	912	73	2	6	..	...
Washington University Unit [1-3]		R. J. Bing	786	65	2	6	..	...
Montana Deaconess Hospital [1-3]	Great Falls, Mont.	J. S. Gilson	1,840	63	2	2	1	275
Veterans Admin. Hospital [1-3]	Lincoln, Neb.	J. R. Gordon	1,111	46	1	3	3	...
Creighton Memorial-St. Joseph's Hospital	Omaha	J. R. Walsh	5,082	92	4	12	3	210
University of Nebraska Hospital [1-3]	Omaha	R. L. Grissom	532	41	2	6	3	200
Veterans Admin. Hospital [1-3-229]	Omaha	J. M Holthaus	1,459	91	4	12	3	...
Dartmouth Medical School Affiliated Hospitals		....	3,979	177	6	18	3	...
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	J. Milne	....	...	..	..	..	218
Veterans Admin. Hospital [1-3]	White River Jct., Vt.	J. L. Grant	....	...	..	..	..	...
Atlantic City Hospital [1]	Atlantic City, N. J.	W. B. Stewart	2,418	173	1	3	3	200
Cooper Hospital [1-3]	Camden, N. J.	E. N. Murray	3,758	181	2	4	3	200
Veterans Admin. Hospital [1-3-235]	East Orange, N. J.	H. A. Weiner	1,438	124	1	6	3	...
Hackensack Hospital [1-3]	Hackensack, N. J.	L. W. Black	2,303	98	2	3	3	150
Jersey City Medical Center	Jersey City, N. J.	T. J. White	7,408	263	10	27	3	108
Mountainside Hospital [1-3]	Montclair, N. J.	M. Block	2,431	147	1	3	3	250
Burlington County Hospital [1-3]	Mount Holly, N. J.	L. E. Viteri	1,479	84	..	4	2	100
Fitkin Memorial Hospital [1-3]	Neptune, N. J.	L. F. Albright	2,312	47	..	2	1	200
Harrison S. Martland Medical Center [1-3]	Newark, N. J.	J. Levin	3,210	150	6	12	3	162
Newark Beth Israel Hospital [1-3]	Newark, N. J.	H. Goldberg	2,523	111	2	4	3	100
St. Michael's Hospital [1-3-240]	Newark, N. J.	N. A. Antonius	2,518	117	3	8	3	165
St. Peter's General Hospital [1-3]	New Brunswick, N. J.	J. Sandella	1,806	79	1	3	1	175
Bergen Pines County Hospital [1-3]	Paramus, N. J.	S. F. Alexander	1,817	230	6	6	1	200
Mercer Hospital [1-3]	Trenton, N. J.	J. F. Pessel	1,817	92	1	1	1	150
Bataan Memorial Methodist Hospital [1-3]	Albuquerque, N. Mex.	R. Streeper	1,732	53	3	9	3	250
Bernalillo County-Indian Hospital	Albuquerque, N. Mex.	T. B. Gibbons	922	79	1	3	3	350
Veterans Admin. Hospital [241]	Albuquerque, N. Mex.	W. S. Taylor	1,861	75	5	10	3	...
Albany Hospital [1-3-243]	Albany, N. Y.	R. T. Beebe	3,414	231	8	20	3	160
Veterans Admin. Hospital [1-3-245]	Albany, N. Y.	J. H. Cullen	2,666	184	5	10	3	...
Binghamton City Hospital [1-3]	Binghamton, N. Y.	M. H. Paushter	3,491	92	2	5	3	225
Beth El Hospital [1-3]	Brooklyn, N. Y.	I. Snapper	2,005	48	5	8	3	150
Brooklyn Hospital [1-3-45]	Brooklyn, N. Y.	G. E. Anderson	2,457	95	4	8	3	175
Jewish Chronic Disease Hospital [1-3]	Brooklyn, N. Y.	M. G. Goldner	1,612	45	14	25	3	175
Jewish Hospital [1-3]	Brooklyn, N. Y.	J. D. Goldstein	2,196	75	6	11	3	100
Kings County Hospital [1-3]								
Division I	Brooklyn, N. Y.	A. Fankhauser	6,029	262	6	19	3	105
Division II	Brooklyn, N. Y.	P. H. Long	5,598	386	5	18	3	105
Long Island College Hospital [1-3]	Brooklyn, N. Y.	J. H. Crawford	2,893	75	3	5	3	156

Numerical and other references will be found on pages 640 through 642.

8. INTERNAL MEDICINE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Lutheran Medical Center [1-3]	Brooklyn, N. Y.	W. F. Rexer	923	45	1	3	3	135
Maimonides Hospital [1-3]	Brooklyn, N. Y.	M. Michael, Jr.	3,256	121	8	15	3	75
Methodist Hospital [1-3]	Brooklyn, N. Y.	H. D. Fearon	2,136	68	2	5	3	175
St. Catherine's Hospital [1-3]	Brooklyn, N. Y.	M. A. Murphy	1,162	49	1	3	3	125
St. John's Episcopal Hospital [1-3]	Brooklyn, N. Y.	E. R. Marzullo	1,641	31	3	5	3	175
St. Mary's Hospital [1-3]	Brooklyn, N. Y.	V. Annunziata	767	25	1	2	1	200
Veterans Admin. Hospital [1-3-263]	Brooklyn, N. Y.	P. W. Spear	2,779	192	18	35	3	...
Buffalo General Hospital [1-3]	Buffalo	J. H. Talbott	4,868	217	4	9	3	175
Deaconess Hospital [1-3]	Buffalo	W. T. Zimdahl	2,490	88	1	3	1	300
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	D. K. Miller	4,266	223	6	21	3	247
Millard Fillmore Hospital [1-3]	Buffalo	J. F. Painton	2,634	151	3	8	3	285
Roswell Park Memorial Institute [1-3]	Buffalo	J. E. Sokal	633	97	..	10	1	318
Veterans Admin. Hospital [1-3-250]	Buffalo	G. W. Bissell	2,644	174	6	12	3	...
Clifton Springs Sanitarium and Clinic [1-3]	Clifton Springs, N. Y.	B. A. Watson	1,401	21	1	3	3	150
Mary Imogene Bassett Hospital [1-3]	Cooperstown, N. Y.	E. D. Thomas	1,102	37	3	6	3	150
Flushing Hospital and Dispensary [1-3-265]	Flushing, N. Y.	C. Cramer	1,782	63	1	3	3	175
Meadowbrook Hospital [1-3]	Hempstead, N. Y.	A. W. Freireich	2,249	234	4	12	3	225
Cornell University Infirmary and Clinic [1-3]	Ithaca, N. Y.	N. S. Moore	1,587	...	4	4	1	208
Tompkins County Memorial Hospital	Ithaca, N. Y.	....	.....	...	..	..	..	...
Jamaica Hospital [1-3]	Jamaica, N. Y.	D. Porte	9,485	...	1	1	1	200
Queens Hospital Center [1-3]	Jamaica, N. Y.	A. A. Fischl	5,190	361	6	12	3	105
Charles S. Wilson Memorial Hospital [1-3]	Johnson City, N. Y.	N. Occhino	4,566	105	3	6	2	225
North Shore Hospital [1-3]	Manhasset, N. Y.	W. J. Messinger	1,130	44	2	4	2	200
Mount Vernon Hospital [1-3]	Mount Vernon, N. Y.	H. Belsky	2,103	104	1	2	2	200
Long Island Jewish Hospital [1-3]	New Hyde Park, N. Y.	E. Mellman	1,928	107	2	4	3	75
New Rochelle Hospital [1-3]	New Rochelle, N. Y.	W. C. Meredith	3,222	93	1	3	3	225
Beekman-Downtown Hospital	New York City	M. McCall	2,406	50	5	5	1	190
Bellevue Hospital Center								
Div. I—Columbia University [1-3-38]	New York City	D. W. Richards	1,789	86	7	13	3	105
Div. II—Cornell University [1-3-21]	New York City	T. P. Almy	1,388	64	9	12	3	105
Div. III—New York University College of Medicine	New York City	L. Thomas	3,692	107	6	16	3	167
Div. IV—New York University Post-Graduate Medical School [271]	New York City	C. F. Wilkinson, Jr.	1,577	73	10	24	3	105
Beth Israel Hospital [1-3]	New York City	A. M. Fishberg	1,878	66	4	8	3	155
Bronx Hospital [1-3]	New York City	E. E. Fischel	2,429	46	4	9	3	100
Bronx Municipal Hospital Center [1-3]	New York City	I. M. London	2,260	257	12	24	3	125
Columbus Hospital [3]	New York City	A. Siragusa	2,629	49	1	3	3	125
42nd Street Beth David Hospital [1-3]	New York City	H. A. Solomon	127	5	1	2	1	...
Francis Delafield Hospital [1-3]	New York City	R. F. Loeb	503	88	3	6	3	105
French Hospital [1-3]	New York City	H. J. McNeile	1,324	23	1	4	3	75
Goldwater Memorial Hospital Columbia University and Research Division [1-3]	New York City	Y. Kneeland, Jr.—D. Seegal	200	21	4	4	1	105
Third New York University Medical Research Service [1-3]	New York City	M. B. Rosenbluth-J. M. Steele	804	54	6	16	1	105
Harlem Hospital [1-3]	New York City	S. S. Paley	3,611	86	3	11	3	105
Hospital for Joint Diseases [1-3]	New York City	M. L. Kramer	782	27	1	2	2	80
Knickerbocker Hospital [1-3]	New York City	M. S. Bruno	2,235	66	3	6	3	150
Lenox Hill Hospital [1-3]	New York City	E. Lawrence—C. E. de la Chapelle	2,171	60	3	9	3	180
Lincoln Hospital [1-3]	New York City	C. R. Messeloff	2,511	64	6	13	3	105
Memorial Center for Cancer and Allied Diseases [1-3]	New York City	R. W. Rawson	1,468	189	8	21	3	150
James Ewing Hospital		....	.....	...	..	..	..	...
Memorial Hospital [1-3]	New York City	....	.....	...	..	..	..	...
Misericordia Hospital [1-3]	New York City	L. V. Rooney	901	20	1	1	1	125
Montefiore Hospital [1-3]	New York City	L. Leiter	4,072	163	20	33	3	187
Morrisania City Hospital [1-3]	New York City	S. Biloon	3,367	150	8	12	2	105
Mount Sinai Hospital [1-3]	New York City	A. B. Gutman	5,913	206	14	32	3	75
New York Hospital [1-3]	New York City	E. H. Luckey	3,458	244	8	27	3	164
New York Infirmary [1-3]	New York City	A. P. McCombs	738	13	1	2	1	150
New York Medical College—Metropolitan Medical Center		L. J. Boyd	.....	...	..	..	..	...
Bird S. Coler Memorial Hospital and Home [1-3]	New York City	....	2,679	98	31	57	1	105
Flower and Fifth Avenue Hospitals [1-3]	New York City	....	1,490	26	1	5	3	100
Metropolitan Hospital [1-3]	New York City	....	4,469	155	6	17	3	105
New York Polyclinic Medical School and Hospital [1]	New York City	J. P. Croce	1,782	39	1	3	3	125
New York University-Bellevue Medical Center								
University Hospital	New York City	C. F. Wilkinson, Jr.	2,151	48	..	1	1	220
Presbyterian Hospital [1]	New York City	R. F. Loeb	7,499	146	12	21	3	250
Roosevelt Hospital [1]	New York City	A. J. Antenucci-J. M. Freston	2,709	98	8	20	3	133
St. Barnabas Hospital for Chronic Diseases [1-3]	New York City	A. J. Patek, Jr.	1,051	42	2	4	2	75
St. Francis Hospital [1-3]	New York City	A. F. Marra	1,873	41	2	4	3	125
St. Luke's Hospital [1-3]	New York City	T. B. Van Itallie	3,014	141	6	16	3	100
St. Vincent's Hospital [1-3]	New York City	W. J. Grace	3,941	207	6	13	3	125
Sydenham Hospital	New York City	E. Appelbaum	778	17	2	3	1	104
Veterans Admin. Hospital (Bronx) [1-3-283]	New York City	J. Wolf	5,389	307	14	40	3	...
Veterans Admin. Hospital (Manhattan) [1-3]	New York City	J. J. Smith	3,357	210	24	38	3	...
Genesee Hospital [1-3]	Rochester, N. Y.	H. Segal	1,831	131	2	5	3	175
Highland Hospital [1-3]	Rochester, N. Y.	J. W. Holler	1,507	97	2	4	3	175
Rochester General Hospital [1-3]	Rochester, N. Y.	L. Horn	2,297	141	3	9	3	125
St. Mary's Hospital [1-3]	Rochester, N. Y.	J. W. Quinlan	2,690	143	1	3	3	220
[illegible] Rochester [illegible] [1-3]	Rochester, N. Y.	L. E. Young	4,745	362	12	36	3	117
[illegible]	Schenectady, N. Y.	H. E. Reynolds	5,291	116	3	7	3	150
[illegible] New York [illegible]nter [1-3]	Syracuse, N. Y.	R. H. Lyons	6,823	358	12	36	3	233
Veterans Admin. Hospital [1-3]	Syracuse, N. Y.	B. V. Jager	2,067	107	..	..	..	...

Numerical and other references will be found on pages 640 through 642.

8. INTERNAL MEDICINE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
Grasslands Hospital [1-3]	Valhalla, N. Y.	W. P. Reed	1,161	113	2	5	3	175
White Plains Hospital [1-3]	White Plains, N. Y.	D. Fertig	1,354	57	1	3	3	175
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	C. H. Burnett	1,430	51	7	15	3	175
Charlotte Memorial Hospital [1]	Charlotte, N. C.	J. M. Alexander	2,394	81	1	3	3	250
Duke University Affiliated Hospitals			....	...	..	..	3	...
Duke Hospital [1-3]	Durham, N. C.	E. A Stead, Jr.	2,702	103	14	36	..	102
Veterans Admin. Hospital [1-3]	Durham, N. C.	W. P. Deiss	2,142	104	7	13	..	...
Watts Hospital [1-3]	Durham, N. C.	I. H. Manning, Jr.	3,641	48	2	5	3	300
City Memorial Hospital [1-3]	Winston-Salem, N. C.	C. H. Reid	5,486	78	1	3	3	300
North Carolina Baptist Hospital [1-3-304]	Winston-Salem, N. C.	E. H. Yount, Jr.	4,569	84	5	11	3	166
Bismarck Hospital [3]	Bismarck, N. Dak.	C. H. Peters	1,850	41	2	2	1	300
St. Luke's Hospital [3]	Fargo, N. Dak.	A. C. Fortney	1,815	61	2	2	1	300
Akron City Hospital [1-3]	Akron, Ohio	T. L. Bliss	4,432	211	2	6	3	250
Akron General Hospital [1]	Akron, Ohio	H. Kraus	2,238	89	3	9	3	250
St. Thomas Hospital [1-3]	Akron, Ohio	M. G. Wince	2,630	115	2	5	2	250
Aultman Hospital [1-3]	Canton, Ohio	H. J. Ickes	5,452	118	3	6	3	275
Mercy Hospital [1-3]	Canton, Ohio	M. F. Moots	3,271	65	2	5	3	200
Christ Hospital [1]	Cincinnati	W. O. Ramey	1,261	84	2	6	1	200
University of Cincinnati College of Medicine Hospital Group			....	...	..	..	3	...
Cincinnati General Hospital [1-3]	Cincinnati	R. W. Vilter	2,359	246	12	30	..	166
Veterans Admin. Hospital [1-3]	Cincinnati	N. Fowler	1,369	126	..	..	..	...
Good Samaritan Hospital [1-3]	Cincinnati	L. B. Owens	3,457	131	2	6	3	250
Jewish Hospital [1-3]	Cincinnati	H. Schiro	2,657	124	6	11	3	195
St. Mary's Hospital [1-3]	Cincinnati	R. S. Green	2,272	63	2	4	3	250
Cleveland Clinic Hospital [1-3]	Cleveland	A. C. Ernstene	1,219	27	19	46	3	175
Cuyahoga County Hospital [1-3]	Cleveland	C. H. Rammelkamp	1,691	165	4	20	3	162
Fairview Park Hospital [1-3]	Cleveland	H. E. Christman	2,799	102	2	4	2	200
Highland View-Cuyahoga County Hospital [1-3]	Cleveland	D. R. Weir	970	90	5	9	1	190
Huron Road Hospital [1-3]	Cleveland	E. A. Marshall	2,317	115	2	6	3	210
Lutheran Hospital [1-3]	Cleveland	M. August	1,492	94	2	4	1	250
Mount Sinai Hospital [1-3]	Cleveland	M. L Siegel	3,045	180	6	10	3	215
St. John's Hospital [1-3]	Cleveland	W. M. Novince	2,067	49	2	3	2	225
St. Luke's Hospital [1-3]	Cleveland	A. D. Nichol	3,894	148	3	8	3	140
St. Vincent Charity Hospital [1-3]	Cleveland	F. R. Hanrahan	4,039	138	4	8	3	210
University Hospitals [1-3]	Cleveland	R H. Ebert	3,996	275	12	30	3	150
Veterans Admin. Hospital [1-3-23-316-318]	Cleveland	N. P. Shumway	2,804	190	6	18	3	...
Mount Carmel Hospital [1-3]	Columbus, Ohio	P T. Knies	1,537	68	4	7	3	275
Ohio State University Hospitals								
University Hospital [1-3]	Columbus, Ohio	B K. Wiseman	3,666	229	6	15	3	177
White Cross Hospital [1-3]	Columbus, Ohio	D. J. Vincent	2,356	77	1	3	3	290
Good Samaritan Hospital [1-3]	Dayton, Ohio	J. P. Kuperman	4,134	77	1	1	1	270
Miami Valley Hospital	Dayton, Ohio	A. J. Gabriele	5,888	194	2	6	3	250
Veterans Admin. Hospital [1-3]	Dayton, Ohio	S. Simerman	1,414	190	10	24	3	...
Marymount Hospital [1-3]	Garfield Heights, Ohio	F. J. Hruby	2,261	29	2	2	1	200
Mercy Hospital [1-3]	Hamilton, Ohio	C. A. Schuck	2,724	97	3	9	1	200
Lakewood Hospital [1-3]	Lakewood, Ohio	J. T. Ledman	2,056	93	3	7	3	200
Lima Memorial Hospital [1-3]	Lima, Ohio	L. N. Irvin	3,210	59	1	3	1	275
St. Rita's Hospital [1-3]	Lima, Ohio	F. G. Maurer	2,782	40	1	3	3	400
Maumee Valley Hospital [1-3]	Toledo, Ohio	M. E. Green	1,255	66	2	5	3	285
Mercy Hospital [1-3]	Toledo, Ohio	G. W. Bascom	513	23	1	3	1	275
St. Vincent's Hospital [1-3]	Toledo, Ohio	M. A. Schnitker	4,750	121	1	3	3	325
Toledo Hospital [1-3]	Toledo, Ohio	J. L. Kobacker	3,800	111	1	3	3	275
Trumbull Memorial Hospital [1]	Warren, Ohio	J. R. McKay	3,071	66	1	3	3	300
St. Elizabeth Hospital [1-3]	Youngstown, Ohio	P. J. Mahar	6,519	93	2	5	2	300
Youngstown Hospital [1-3]	Youngstown, Ohio	J. Noll	2,082	95	3	8	3	325
St. Anthony Hospital	Oklahoma City	P. M. McNeill	2,248	64	1	2	2	300
University of Oklahoma Medical Center			....	...	..	..	..	...
University Hospital [1-3-325]	Oklahoma City	S. G. Wolf, Jr.	1,523	97	10	28	3	200
Veterans Admin. Hospital [3]	Oklahoma City	J. F. Hammarsten	2,634	135	5	16	3	...
Wesley Hospital [1]	Oklahoma City	W. W. Rucks, Jr.	1,289	50	1	1	1	250
St. John's Hospital	Tulsa, Okla.	W. J. O'Mellia	4,206	63	2	6	2	175
Emanuel Hospital [1-3]	Portland, Ore.	R. Alleman	3,667	110	1	3	3	275
Good Samaritan Hospital [1-3]	Portland, Ore.	W. Larson	3,086	81	2	6	3	275
Providence Hospital [1-3]	Portland, Ore.	R. McMahon	3,515	160	2	5	3	275
St. Vincent's Hospital [1-3]	Portland, Ore.	E. E Rosenbaum	5,092	157	2	6	3	275
University of Oregon Medical School Hospitals and Clinics [1-3]	Portland, Ore.	H. P Lewis	3,100	247	3	9	3	125
Veterans Admin. Hospital [1-3]	Portland, Ore.	L. W. Ritzmann	2,314	163	8	19	3	...
Abington Memorial Hospital [1-3]	Abington, Pa.	J. T. Beardwood, Jr.	1,840	109	1	4	3	150
Allentown Hospital [1-3]	Allentown, Pa.	C. H. Kelchner	2,332	133	1	3	3	225
Sacred Heart Hospital [1-3]	Allentown, Pa.	A. W. Dubbs	2,526	66	1	2	2	225
St. Luke's Hospital [1-3]	Bethlehem, Pa.	R. K. Shields	2,526	108	1	2	3	225
Bryn Mawr Hospital [1-3]	Bryn Mawr, Pa.	W. W. Dyer	2,903	144	2	6	3	200
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	J. A. Collins	2,523	85	3	8	3	175
Easton Hospital [1-3]	Easton, Pa.	J. Kincov	2,126	105	2	3	2	250
Hamot Hospital [1-3]	Erie, Pa.	J. B. Tredway	3,585	105	1	3	2	250
Harrisburg Hospital [1-3]	Harrisburg, Pa.	J. A. Daugherty	3,644	133	2	4	3	250
Harrisburg Polyclinic Hospital	Harrisburg, Pa.	A. W. Cowley	3,135	149	2	4	3	250
Albert Einstein Medical Center								
Northern Division [1]	Philadelphia	B. A. Gouley	2,817	129	8	18	3	125
Southern Division [1-3]	Philadelphia	T. Mendell	2,480	86	2	5	3	125
Chestnut Hill Hospital [1]	Philadelphia	R. M. Truitt, Jr.	1,186	56	2	2	1	350
Episcopal Hospital [1-3]	Philadelphia	S. R. Vogel	2,284	96	2	6	3	150
Frankford Hospital [1-3]	Philadelphia	G. E. Mark, Jr.	1,285	57	1	2	1	250
Germantown Dispensary and Hospital [1-3]	Philadelphia	R. W. Mays	2,177	101	1	3	3	175
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	H. L. Bockus	1,486	65	3	6	3	100
Hahnemann Medical College and Hospital [1-3]	Philadelphia	J. H. Moyer	2,638	117	4	12	3	75
Hospital of the University of Pennsylvania [1-3]	Philadelphia	F. C. Wood	5,169	192	14	45	3	...
Hospital of the Woman's Medical College of Pennsylvania [1-3]	Philadelphia	W. G. Leaman	1,436	51	1	5	3	110
Jefferson Medical College Hospital [1-3]	Philadelphia	W. A. Sodeman	4,098	163	8	12	3	100

Numerical and other references will be found on pages 640 through 642.

8. INTERNAL MEDICINE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Lankenau Hospital [1-3]	Philadelphia	D. B. Pierson-E. L. Bortz	2,664	114	2	4	2	200
Mercy-Douglass Hospital	Philadelphia	E. E. Holloway	534	12	2	4	1	150
Methodist Episcopal Hospital [1-3]	Philadelphia	H. F. Robertson	1,939	61	2	2	1	150
Nazareth Hospital [1]	Philadelphia	S. J. Skromak	1,316	55	..	..	1	150
Pennsylvania Hospital [1-3]	Philadelphia	G. G. Duncan	3,052	178	11	11	3	20
Philadelphia General Hospital [1-3]	Philadelphia	C. M. Thompson	5,347	606	6	19	3	121
Presbyterian Hospital [1-3]	Philadelphia	G. P. Rouse	2,249	118	2	6	3	175
Temple University Hospital [1-3]	Philadelphia	T. M. Durant	3,984	127	4	12	3	...
Veterans Admin. Hospital [1-3]	Philadelphia	H. P. Close	2,222	121	9	19	3	...
Allegheny General Hospital [1]	Pittsburgh	V. B. Callomon	2,490	137	1	3	3	200
Health Center Hospital of the University of Pittsburgh Sc[illegible]								
[illegible] Hospital [1-3]	Pittsburgh	C. R. Schaefer	1,605	57	1	3	3	12
[illegible] [1-3]	Pittsburgh	J. D. Myers	2,888	131	6	13	3	12
Me[illegible]	Pittsburgh	J. M. Johnston	1,446	14	3	9	3	23
Montefiore Hospital [1-3]	Pittsburgh	J. H. Silverberg	3,011	109	6	6	3	22
Pittsburgh Hospital [1-3]	Pittsburgh	A. V. Morgan	1,627	44	1	3	1	20
St. Francis General Hospital and Rehabilitation Institute [1-3]	Pittsburgh	F. Concilus	4,370	112	2	4	3	22
St. Margaret Memorial Hospital [1-3]	Pittsburgh	C. J. Bowen	1,328	46	1	1	1	30
Veterans Admin. Hospital [1-3]	Pittsburgh	A. S. Glushien	3,570	258	8	20	3	..
Western Pennsylvania Hospital [3]	Pittsburgh	R. L. Forsyth	3,449	140	2	6	3	22
Reading Hospital [1-3]	Reading, Pa.	J. R. Spannuth	2,421	196	2	6	3	22
Robert Packer Hospital [1-3]	Sayre, Pa.	S. D. Conklin	3,995	64	3	9	3	225
Rhode Island Affiliated Hospitals		......	.....	...	..	..	3	...
Newport Hospital [1-3]	Newport, R. I.	H. W. Brownell	1,314	...	1	1	..	150
Memorial Hospital [1-3]	Pawtucket, R. I.	A. M. Burgess	587	67	..	1	..	225
Miriam Hospital [1-3]	Providence, R. I.	E. A. Sharp	1,546	31	..	1	..	250
Rhode Island Hospital [1-3]	Providence, R. I.	M. N. Fulton	3,855	211	5	9	3	125
Veterans Admin. Hospital [1-3]	Providence, R. I.	R. W. Phillips	1,713	76	2	4	2	...
Teaching Hospitals of the Medical College of South Carolina	Charleston, S. C.	V. Moseley	2,600	110	7	14	3	137
Medical College Hospital		......	.....	...	..	..	..	...
Roper Hospital		......	.....	...	..	..	..	...
Columbia Hospital of Richland County [1]	Columbia, S. C.	W. C. McLain, Jr.	4,521	79	1	1	1	175
Veterans Admin. Hospital	Columbia, S. C.	S. L. Zimmerman	3,914	129	2	6	3	...
Baroness Erlanger Hospital [1-3]	Chattanooga, Tenn.	A. S. Easley	4,854	131	4	7	3	250
St. Mary's Memorial Hospital [1-3]	Knoxville, Tenn.	E. C. Sienknecht	4,657	69	2	3	2	250
University of Tennessee Memorial Research Center and Hospital	Knoxville, Tenn.	R. B. Wood	1,670	61	1	3	3	250
City of Memphis Hospitals [1-3]	Memphis, Tenn.	I. F. Tullis	2,775	323	6	16	3	150
St. Joseph Hospital [1-3]	Memphis, Tenn.	S. B. Blackwell	3,673	71	1	3	3	250
Veterans Admin. Hospital [1-3-333]	Memphis, Tenn.	F. S. Dietrich	3,500	147	2	11	3	...
Baptist Hospital [1-3]	Nashville, Tenn.	C. C. Woodcock	2,829	18	2	1	1	300
George W. Hubbard Hospital [1-3]	Nashville, Tenn.	G. B. Brothers	1,219	52	2	5	3	125
Nashville General Hospital [1-3]	Nashville, Tenn.	W. J. Card	1,202	43	2	4	1	175
St. Thomas Hospital [1-3]	Nashville, Tenn.	J. J. Callaway	2,310	55	2	4	3	300
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	H. J. Morgan	3,449	111	..	13	3	50
Veterans Admin. Hospital [1-3]	Nashville, Tenn.	R. France	2,510	102	4	11	3	...
Oak Ridge Institute of Nuclear Studies [1-3-21]	Oak Ridge, Tenn.	G. A. Andrews	352	27	..	2	1	167
Baylor University Hospital [1-3]	Dallas, Texas	R. Tompsett	5,630	171	3	9	3	175
Methodist Hospital [1-3]	Dallas, Texas	A. E. Haley	599	8	1	4	3	200
Parkland Memorial Hospital [1-3]	Dallas, Texas	D. Seldin	3,054	181	10	22	3	150
St. Paul's Hospital [1-3]	Dallas, Texas	P. Q. Needham	3,708	154	2	6	3	150
Veterans Admin. Hospital [1-3-358]	Dallas, Texas	B. Friedman	2,509	136	5	14	3	...
Harris Hospital [1]	Fort Worth, Texas	J. M. Church	5,907	104	2	4	2	200
University of Texas Medical Branch Hospitals [1-3-19]	Galveston, Texas	C. T. Stone, Sr.	3,661	216	8	20	3	160
Baylor University College of Medicine Affiliated Hospitals								
Jefferson Davis Hospital [1-3]	Houston, Texas	J. A. Greene	1,829	194	5	13	3	75
Methodist Hospital [1-3]	Houston, Texas	H. W. Cummings, Jr.	3,387	81	1	3	3	220
Veterans Admin. Hospital [1-3]	Houston, Texas	H. D. Bennett	4,679	241	7	21	3	...
Hermann Hospital [1-3]	Houston, Texas	E. A. Wilkerson	5,772	147	2	6	3	125
St. Joseph's Hospital [1-3]	Houston, Texas	S. Schnur	1,844	14	..	1	1	220
University of Texas M.D. Anderson Hospital and Tumor Institute [1-3]	Houston, Texas	C. D. Howe	984	194	..	8	1	150
Veterans Admin. Hospital [1-3]	McKinney, Texas	G. A. Edwards	1,455	42	2	4	3	...
Robert B. Green Memorial Hospital [1-3]	San Antonio, Texas	L. B. Reppert	1,007	140	1	2	2	150
Santa Rosa Hospital [1-3]	San Antonio, Texas	R. E. Nitschke	3,246	124	1	1	1	250
Scott and White Memorial Hospitals [1-3]	Temple, Texas	J. G. Rodarte	5,716	58	2	6	3	300
Thomas D. Dee Memorial Hospital [1]	Ogden, Utah	G. H. Keyes	2,669	174	2	2	1	325
Dr. W. H. Groves Latter Day Saints Hospital [1-3]	Salt Lake City	A. P. MacFarlane	3,413	122	2	4	3	250
Holy Cross Hospital [1-3]	Salt Lake City	G. Gross	1,428	43	1	1	1	175
University of Utah College of Medicine Affiliated Hospitals		......	.....	...	..	..	3	...
Salt Lake County General Hospital [3]	Salt Lake City	M. Wintrobe	1,224	85	6	16	..	220
Veterans Admin. Hospital (12th Avenue) [1-3]	Salt Lake City	H. W. Harris	1,055	62	2	7	..	...
University of Vermont Affiliated Hospitals								
De Goesbriand Memorial Hospital	Burlington, Vt.	C. M. Terrien	1,849	57	1	2	2	167
Mary Fletcher Hospital [1-3]	Burlington, Vt.	E. L. Amidon	1,664	49	3	6	2	100
Alexandria Hospital [3]	Alexandria, Va.	J. C. Watson	1,668	137	3	3	1	275
University of Virginia Hospital [1-3]	Charlottesville, Va.	W. Parson	2,841	75	11	22	3	50
Chesapeake and Ohio Hospital [1-3]	Clifton Forge, Va.	A. Williams	3,533	54	4	4	1	200
Riverside Hospital [1-3]	Newport News, Va.	E. B. Mewborne	2,170	60	1	1	1	250
De Paul Hospital [1-3]	Norfolk, Va.	R. Gahagan	2,109	90	2	5	3	200
Norfolk General Hospital [1-3]	Norfolk, Va.	J. Franklin	2,680	111	2	4	3	215
Johnston-Willis Hospital [1-3]	Richmond, Va.	J. M. Hutcheson	2,642	86	2	2	1	250

Numerical and other references will be found on pages 640 through 642.

8. INTERNAL MEDICINE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Medical College of Virginia— Hospital Division [1-3-371]	Richmond, Va.	H. Walker	4,575	191	10	19	3	75
Veterans Admin. Hospital [1-3-372]	Richmond, Va.	W. T. Thompson, Jr.	4,881	161	9	27	3	...
Jefferson Hospital [1-3]	Roanoke, Va.	R. Crawford	1,183	30	1	1	1	200
Doctors Hospital [1-3]	Seattle	Q. B. Demarsh	2,406	152	1	2	1	250
Providence Hospital [1-3]	Seattle	K. E. Hynes	2,706	88	1	2	2	215
Swedish Hospital [1-3]	Seattle	D. R. Sparkman	4,078	183	1	1	1	225
University of Washington College of Medicine Affiliated Hospitals			.....	...	..	..	3	...
King County Hospital Unit No. 1 (Harborview) [1]	Seattle	R. H. Williams	4,436	299	6	13	..	125
Veterans Admin. Hospital [1-3]	Seattle	R. S. Evans	1,510	153	6	12	..	...
Virginia Mason Hospital [1-3]	Seattle	R. L. King	2,938	82	2	6	3	150
Beckley Memorial Hospital [1-3]	Beckley, W. Va.	A. D. Kistin	1,881	62	2	6	3	400
Charleston General Hospital [1-3]	Charleston, W. Va.	W. A. Thornhill, Jr.	2,647	48	2	5	3	225
Memorial Hospital [1-3]	Charleston, W. Va.	W. C. Stewart	2,310	36	1	3	3	250
Cabell Huntington Hospital [1-3]	Huntington, W. Va.	J. F. Carr	2,137	44	1	1	1	250
Chesapeake and Ohio Hospital [1-3]	Huntington, W. Va.	J. F. Otto, Jr.	2,510	32	4	6	1	200
Ohio Valley General Hospital [1-3]	Wheeling, W. Va.	C. H. Hiles	3,018	69	2	6	3	300
La Crosse Lutheran Hospital [1-3]	La Crosse, Wis.	T. E. Gundersen	2,975	38	1	1	2	300
Madison General Hospital [1-3]	Madison, Wis.	A. J. Richtsmeier	2,766	104	2	2	1	175
St. Mary's Hospital [1-374]	Madison, Wis.	R. N. Allin	1,918	60	1	3	3	250
University Hospitals [1-3-376]	Madison, Wis.	O. O. Meyer	5,269	112	7	21	3	100
St. Joseph's Hospital	Marshfield, Wis.	G. E. Magnin	296	32	2	2	1	350
Columbia Hospital [1-377]	Milwaukee	H. W. Pohle	2,775	83	1	3	2	245
Milwaukee County Hospital [1-3]	Milwaukee	W. W. Engstrom	13,748	417	8	24	3	207
Milwaukee Hospital [1-3-381]	Milwaukee	E. R. Daniels	2,323	95	1	2	2	270
Mount Sinai Hospital [3]	Milwaukee	N. Grossman	1,504	31	2	4	2	200
St. Joseph's Hospital [1-3]	Milwaukee	P. G. La Bissoniere	2,217	60	1	3	2	280
St. Luke's Hospital [1-3]	Milwaukee	J. Meyer	1,953	42	2	2	1	275
St. Mary's Hospital [1-3]	Milwaukee	M. C. F. Lindert	1,492	75	2	3	1	300
Veterans Admin. Hospital [1-3-29-382]	Milwaukee (Wood), Wis.	M. W. Garry	4,191	247	4	15	3	...
Gorgas Hospital [1]	Ancon, C. Z.	J. R. Vivas	2,902	43	2	4	..	345
Queen's Hospital [1-3-387]	Honolulu, T. H.	H. Gotshalk	3,251	128	3	7	3	150
St. Francis Hospital [1-3]	Honolulu, T. H.	C. M. Lum	2,339	46	2	6	2	150
Bayamon Charity District Hospital [1-3]	Bayamon, P. R.	R. Rodriquez	1,254	61	2	5	3	250
Ponce General District [illegible]	Ponce, P. R.	H. F. Rodriguez	1,906	83	3	7	3	250
San Juan City Hospital	Juan, P. R	R. S. Diaz Rivera	1,091	55	4	12	3	150
Veterans Admin. Hospit	Juan, P. R.	E. A. Ramirez	1,461	32	2	5	3	...

9. NEUROLOGICAL SURGERY

Residency programs in the following hospitals have been approved by the Council and the American Board of Neurological Surgery, through the Residency Review Committee for Neurological Surgery, as offering acceptable training in the specialty.

Hospitals, 117; Assistant Residencies and Residencies, 367

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES ARMY								
Army Medical Center [1-3]	*Washington, D. C.*	*G. J. Hayes*	*668*	*36*	*1*	*4*	*4*	...
NONFEDERAL AND VETERANS ADMINISTRATION								
University of Alabama Medical Cente-			.....	..	..	..	3	...
University Hospital and Hillman Cl		J. G. Galbraith	1,059	41	1	2	..	108
Veterans Admin. Hospital [1-3]		J. D. French	286	26	1	3	4	...
Los Angeles County Hospital [1]	Los Angeles	C. W. Rand	2,313	175	1	5	4	246
University of California Medical Center			.....	..	..	..	4	...
University Hospital [1-3]	Los Angeles	W. E. Stern	216	7	1	4	..	220
Veterans Admin. Hospital [1-3]	Los Angeles	W. E. Stern	403	17	1	2	..	...
White Memorial Hospital [1-3-67]	Los Angeles	P. J. Vogel	411	20	2	4	4	215
Collis P. and Howard Huntington Memorial Hospital [1-3]	Pasadena, Calif.	*C. H. Shelden-R. H. Pudenz*	*602*	*25*	*1*	*4*	*4*	*300*
University of California Hospitals			.....	..	..	..	4	...
Franklin Hospital [1-60]	San Francisco	H. A. Brown	729	7	..	..	..	...
University of California Hospitals [3]	San Francisco	J. E. Adams	682	29	2	8	..	231
Veterans Admin. Hospital [1-3]	San Francisco	*O. W. Jones, Jr.*	125	11	..	2	..	...
University of Colorado Medical Center			.....	..	..	..	4	...
Colorado General Hospital [1-3]	Denver	C. G. Freed	230	12	1	4	..	180
Denver General Hospital [1-3]	Denver	*C. G. Freed*	231	22	..	..	..	...
Veterans Admin. Hospital [1-3]	Denver	K. Welch	113	7	..	..	..	...
Grace-New Haven Community Hospital—Hartford Hospital			.....	..	..	..	4	...
Hartford Hospital [1-3]	Hartford, Conn.	W. B. Scoville	1,189	63	2	5	..	125
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	W. J. German	547	26	..	2	..	140
Georgetown University Affiliated Hospitals		O. H. Fulcher	.....	..	..	..	4	...
Children's Hospital [1-3]	Washington, D. C.	J. Williams	111	3	1	1	..	100
District of Columbia General Hospital [1-3]	Washington, D. C.		.....	..	..	2	..	283
Georgetown University Hospital [1-3-112]	Washington, D. C.		335	16	1	4	..	175
George Washington University Hospitals		J. W. Watts	.....	..	..	..	4	...
Children's Hospital	Washington, D. C.	J. Williams	111	3	1	1	..	100
District of Columbia General Hospital	Washington, D. C.		.....	..	..	2	..	283
George Washington University Hospital	Washington, D. C.		632	52	1	4	..	150
Emory University Affiliated Hospitals			.....	..	..	..	4	...
Grady Memorial Hospital	Atlanta, Ga.		140	2	..	..	..	...
Emory University Hospital [1-3]	Emory University, Ga.	E. F. Fincher	273	13	1	4	..	235

Numerical and other references will be found on pages 640 through 642.

9. NEUROLOGICAL SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Loyola University (Stritch School of Medicine) Affiliated Hospitals		.....	.....	..	..	..	4	...
Mercy Hospital [1-3]	Chicago	H. C. Voris	650	12	1	4	..	200
Veterans Admin. Hospital [1-3]	Hines, Ill.	E. Oldberg-H. C. Voris	444	12	1	2	..	...
Northwestern University Medical Center		.....	.....	..	..	..	4	...
Chicago Wesley Memorial Hospital [1-3]	Chicago	P. C. Bucy	420	17	..	3	4	125
Passavant Memorial Hospital [1-3]	Chicago	L. Davis	112	6	..	1	..	125
Veterans Admin. Research Hospital [1-3]	Chicago	L. Davis	153	4	..	1	..	...
Evanston Hospital [1-3]	Evanston, Ill.	J. Tarkington	96	8	1	1	..	225
Presbyterian-St. Luke's Hospital								
Presbyterian Hospital Division [1-3]	Chicago	E. Oldberg	197	6	1	2	3	125
St. Luke's Hospital Division [1-3]	Chicago	E. Oldberg	(See University of Illinois Neuropsychiatric Institute)					
University of Chicago Clinics [1-3]	Chicago	J. P. Evans	427	19	2	6	3	200
University of Illinois Neuropsychiatric Institute [1-3-131]	Chicago	E. Oldberg	Incl. in Neurology		..	..	4	...
Indiana University Medical Center		R. F. Heimburger	.....	..	1	3	4	...
Indiana University Medical Ce[illegible]		.....	432	36	..	..	..	165
Veterans Admin. Hospital [1-3]		.....	140	13	..	..	..	...
State University of Iowa Hospitals [1-3]	Iowa City	R. Meyers	636	36	..	3	4	200
University of Kansas Medical Center [1-3]	Kansas City, Kan.	W. Williamson	437	16	1	4	4	125
University of Louisville Medical C[illegible]		.....	.....	..	..	..	4	...
Children's Hospital		.....	.....	..	..	..	..	...
Louisville General Hospital [1-3]		R. G. Spurling	1,200	42	1	4	..	105
Norton Memorial Hospital	Louisville, Ky.	.....	241	3	..	..	..	...
Veterans Admin. Hospital [1-3]	Louisville, Ky.	E. Grantham	196	6	..	1	..	...
Charity Hospital of Louisiana Tulane University Unit [1]	New Orleans	D. H. Echols	298	18	..	1	1	175
Ochsner Foundation Hospital [1-3-155]	New Orleans	D. H. Echols	372	12	1	4	4	225
Johns Hopkins Hospital [1-3]	Baltimore	A. E. Walker	823	19	2	6	1	160
Baltimore City Hospital	Baltimore	J. D. McQueen	268	10	..	1	..	150
University Hospital [1]	Baltimore	J. G. Arnold	775	21	1	6	4	75
Boston City Hospital [1-3]	Boston	W. Wegner	381	19	1	5	4	132
Children's Medical Center	Boston	F. D. Ingraham	556	18	..	4	4	...
Peter Bent Brigham Hospital [1-3]	Boston	F. D. Ingraham	Incl. in Surgery		..	4	..	42
Massachusetts General Hospital [1-3]	Boston	J. C. White	898	..	2	5	4	67
Veterans Admin. Hospital [1-3]	Boston (Jamaica Plain)	J. H Drew	387	27	..	..	..	...
New England Center Hospital [1-3]	Boston	B. Selverstone	358	7	1	4	4	100
University Hospital [1-3]	Ann Arbor, Mich.	E. A. Kahn	975	66	1	6	4	195
Grace Hospital [1-3-200]	Detroit	E. S. Gurdjian	690	22	1	4	4	275
Henry Ford Hospital [1-3]	Detroit	R. S. Knighton	488	20	2	6	4	250
University of Minnesota Hospitals [1-3-206]	Minneapolis	W. T. Peyton	547	20	..	5	4	209
M[illegible]	Rochester, Minn.	J. G. Love	2,383	40	6	24	4	175
U[illegible]		.....	.....	..	..	..	4	...
University Hospital [1]	Jackson, Miss.	O. J. Andy	321	17	1	4	..	250
Veterans Admin. Hospital	Jackson, Miss.	.....	122	13	..	..	..	...
Barnes Hospital [1-3]	St. Louis	H. G. Schwartz	585	45	2	6	4	75
Dartmouth Medical School Affiliated Hospitals		R. G. Fisher	631	30	1	4	4	...
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	.....	.....	..	..	..	..	218
Veterans Admin. Hospital [1-3]	White River Jct., Vt.	.....	.....	..	..	..	..	...
Albany [illegible] [1-3]	Albany, N. Y.	R. D. Whitfield	1,023	34	1	4	4	160
Kings [illegible]ion II [1-3]	Brooklyn, N. Y.	E. J. Browder	3,243	86	1	4	4	105
Long [illegible]	Brooklyn, N. Y.	E. J. Browder	.....	..	..	..	..	...
Buffalo [illegible]al	Buffalo	W. B. Hamby	516	21	1	3	4	175
Albert [illegible]dicine Affiliated Hospitals		.....	.....	..	..	..	4	...
Bronx Municipal Hospital Center [1-3]	New York City	L. M. Davidoff	202	20	1	4	..	125
Montefiore Hospital [1-3]	New York City	.....	.....	..	..	..	..	...
Bellevue Hospital Center Div. IV—New York University Post-Graduate Medical School [272]	New York City	T. I. Hoen	306	25	2	8	3	71
Mount Sinai Hospital [1-3]	New York City	S. W. Gross	348	13	1	3	4	75
New York Hospital [1-3]	New York City	B. S. Ray	286	..	..	2	4	206
Presbyterian Hospital (Neurological Institute) [1]	New York City	J. L. Pool	681	27	4	9	4	266
St. Vincent's Hospital [1-3]	New York City	C. G. de Gutierrez-Mahoney	964	28	1	4	4	125
Veterans Admin. Hospital (Bronx) [1-3-232]	New York City	J. E. Scarff	771	12	1	4	4	...
Strong Memorial-Rochester Municipal Hospital [1-3]	Rochester, N. Y.	F. P. Smith	422	..	..	2	4	117
Duke University Affiliated Hospitals		.....	.....	..	..	..	4	...
Duke Hospital [1-3]	Durham, N. C.	B. Woodhall	1,049	30	1	5	..	127
Veterans Admin. Hospital [1-3]	Durham, N. C.	B. Nashold	384	21	..	2	..	...
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	E. Alexander, Jr.	709	26	1	4	4	166
University of Cincinnati College of Medicine Hospital Group		.....	.....	..	..	..	4	...
Children's Hospital [1-3]	Cincinnati	.....	.....	..	..	..	..	...
Christ Hospital [1]	Cincinnati	F. H. Mayfield	402	22	1	1	..	200
Cincinnati General Hospital [1-3]	Cincinnati	R. L. McLaurin	336	27	1	5	..	200
Good Samaritan Hospital [1-3]	Cincinnati	F. H. Mayfield	145	8	..	1	..	300
Veterans Admin. Hospital [1-3]	Cincinnati	R. L. McLaurin	156	8	..	..	..	...
Cleveland Clinic Hospital [1-3]	Cleveland	W. J. Gardner	895	33	2	6	4	175
Western Reserve University Affiliated Hospitals		.....	.....	..	1	4	4	...
Cuyahoga County Hospital [1-3]	Cleveland	B. M. Bloor	235	30	..	..	..	162
University Hospitals [1-3]	Cleveland	F. E. Nulsen	385	24	..	..	..	183
Veterans Admin. Hospital [1-3]	Cleveland	F. E. Nulsen	299	25	..	..	4	...
Ohio State University Hospitals		.....	.....	..	..	..	..	...
Children's Hospital [1]	Columbus, Ohio	M. P. Sayers	558	27	..	2	..	200
University Hospital [1-3]	Columbus, Ohio	H. E. Le Fever	499	51	..	3	..	202
White Cross Hospital [1-3]	Columbus, Ohio	W. E. Hunt	636	14	1	2	4	200
University of Oklahoma Hospitals [1-3-330]	Oklahoma City	H. Wilkins	256	15	1	2	4	200
Good Samaritan Hospital [1-3]	Portland, Ore.	J. Raaf	1,153	22	1	5	4	275
University of Oregon Medical School Affiliated Hospitals		.....	.....	..	..	..	..	...
University of Oregon Medical School Hospitals and Clinics [1-3]	Portland, Ore.	G. M. Austin	262	13	1	3	..	125
Veterans Admin. Hospital [1-3]	Portland, Ore.	.....	.....	..	..	..	..	...

Numerical and other references will be found on pages 640 through 642.

9. NEUROLOGICAL SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[9]	Length of Approved Program (Years)	Beginning Stipend (Month)
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	R. A. Groff	480	17	2	4	4	100
ge and Hospital [1-3]	Philadelphia	A. K. Olsen	259	6	1	1	3	75
of Pennsylvania [1-3]	Philadelphia	R. Groff	358	14	1	4	4	...
Hospital [1-3]	Philadelphia	R. Jaeger	354	14	1	2	4	100
Temple University Hospital [1-3]	Philadelphia	M. Scott	775	29	1	4	4	...
Health Center Hospitals of the University of Pittsburgh School of Medicine [1-3]	Pittsburgh	...	.....	...	..	..	4	...
Children's Hospital [1-3]	Pittsburgh	J. F. Grunnagle	462	24	..	..	..	...
Presbyterian Hospital and Women's Hospital [1-3]	Pittsburgh	S. N. Rowe	1,780	40	1	4	..	150
Mercy Hospital [1-3]	Pittsburgh	F. H. Bragdon	520	14	1	3	3	235
Robert Packer Hospital [1-3]	Sayre, Pa.	A. B. King	476	18	1	1	1	225
University of Tennessee Medical Center Hospitals		...	.....	...	..	..	4	...
Baptist Memorial Hospital [1-3]	Memphis, Tenn.	R. L. De Saussure	2,120	29	2	8	..	200
City of Memphis Hospitals [1-3]	Memphis, Tenn.	F. Murphey	555	20	1	2	..	150
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	W. F. Meacham	705	30	1	4	4	50
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	S. R. Snodgrass	539	22	1	4	4	160
Baylor University College of Medicine Affiliated Hospitals		...	.....	...	..	..	4	...
Jefferson Davis Hospital [1-3]	Houston, Texas	J. Greenwood	157	24	..	1	..	100
Methodist Hospital [1-3]	Houston, Texas	J. Greenwood, Jr.	840	25	1	3	..	220
Veterans Admin. Hospital [1-3-360]	Houston, Texas	J. W. Robertson	346	25	2	5	..	...
University of Vermont Affiliated Hospitals		R. M. P. Donaghy	481	13	1	4	4	167
DeGoesbriand Memorial Hospital	Burlington, Vt.	...	.....	...	..	..	..	...
Mary Fletcher Hospital	Burlington, Vt.	...	.....	...	..	..	..	...
University of Virginia Hospitals		...	.....	...	..	..	4	...
University Hospital [1-3]	Charlottesville, Va.	W. G. Crutchfield	858	5	1	4	..	50
Veterans Admin. Hospital [1-3]	Richmond, Va.	J. L. Ulmer	334	9	1	2	..	...
Medical College of Virginia—Hospital Division [1-3]	Richmond, Va.	J. M. Meredith	1,208	28	1	4	4	75
University of Washington Affiliated Hospitals		A. A. Ward, Jr.	.....	...	..	..	4	...
King County Hospital Unit No. 1 (Harborview) [1]	Seattle	...	413	52	1	4	..	226
Veterans Admin. Hospital [1-3]	Seattle	...	190	13	1	2	..	...
University Hospitals [1-3]	Madison, Wis.	T. C. Erickson	516	43	1	4	4	100

10. NEUROLOGY

Residency programs in the following hospitals have been approved for THREE years of training by the Council and the American Board of Psychiatry and Neurology, through the Residency Review Committee for Psychiatry and Neurology. (Applicants intending to qualify for examination by the American Board of *Psychiatry and Neurology, Inc., should refer to the Board requirements that the candidate have had at least* two of the three years of his training in a program or programs approved at the two or three year level.)

Hospitals, 67; Assistant Residencies and Residencies, 329

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[9]	Beginning Stipend (Month)
UNITED STATES ARMY							
Army Medical Center [1-3]	Washington, D. C.	H. W. Hogan	391	4	2	6	...
NONFEDERAL AND VETERANS ADMINISTRATION							
University of California Hospital [1-3]	Los Angeles	A. S. Rose	67	...	1	3	229
Stanford University Hospitals [1-3]	San Francisco	H. Newman	184	1	1	1	100
University of California Hospitals [3-53]	San Francisco	R. B. Aird	554	2	4	10	231
Veterans Admin. Hospital [1-3-54]	San Francisco	H. W. Newman	218	3	1	3	...
University of Colorado Medical Center							
Colorado General Hospital [1-3]	Denver	L. E. Daniels	233	4	2	4	180
Denver General Hospital [1-3]	Denver	...	Incl. in Int. Med.		..	..	...
Veterans Admin. Hospital [1-3]	Denver	W. V. Huber	522	47	1	2	...
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	G. H. Glaser	500	...	1	3	150
Georgetown University Hospital [1-3-113]	Washington, D. C.	F. M. Forster	146	4	2	7	300
Veterans Admin. Hospital [1-3-119]	Washington, D. C.	H. F. Corson	101	2	2	4	...
Jackson Memorial Hospital [1-3]	Miami, Fla.	P. Scheinberg	654	57	2	6	75
Northwestern University Medical Center [1-3-394]	Chicago	B. Boshes	358	6	3	9	240
Chicago Wesley Memorial Hospital [1-3]	Chicago	B. Boshes	256	3	1	1	125
Veterans Admin. Research Hospital	Chicago	H. Koenig	102	3	..	1	...
Presbyterian-St. Luke's Hospital							
St. Luke's Hospital Division [1-3-131]	Chicago	R. P. Mackay	176	12	1	3	125
University of Chicago Clinics [1-3]	Chicago	R. B. Richter	292	7	1	3	200
University of Illinois Neuropsychiatric Institute [1-3]	Chicago	E. Oldberg	636	40	1	6	140
Veterans Admin. Hospital [1-3]	Hines, Ill.	E. Tigay	1,057	51	4	4	...
Indiana University Affiliated Hospitals		A. T. Ross	.....	...	..	..	...
Indianapolis General Hospital	Indianapolis	...	255	35	1	1	205
Indiana University Medical Center [1]	Indianapolis	...	Incl. in Med. & Ped.		2	6	165
State University of Iowa Hospitals [1-3-27]	Iowa City	A. L. Sahs	1,133	15	2	4	175
University of Kansas Medical Center [1-3]	Kansas City, Kan.	A. T. Steegmann	312	5	2	4	125
Veterans Admin. Hospital [1-3]	Kansas City, Mo.	A. B. Williamson, Jr.	330	23	..	..	...
University of Louisville Affiliated Hospitals							
Louisville General Hospital [1-3]	Louisville, Ky.	E. Roseman	753	60	1	3	131
Veterans Admin. Hospital [1-3]	Louisville, Ky.	E. Roseman	292	17	..	..	...
Charity Hospital of Louisiana							
Louisiana State University Unit [1]	New Orleans	R. Paddison	704	9	1	3	100
Tulane University, Unit [1]	New Orleans	R. G. Heath	818	10	1	3	100
Baltimore City Hospitals [1-3]	Baltimore	J. W. Magladery	916	57	2	3	125
Johns Hopkins Hospital [1-3]	Baltimore	J. W. Magladery	Incl. in Int. Med.		1	3	160
University Hospital [1]	Baltimore	C. Van Buskirk	144	4	2	5	75
Boston City Hospital [1-3]	Boston	D. E. Denny-Brown	364	10	4	10	132
Massachusetts General Hospital [1-3]	Boston	R. D. Adams	786	...	4	5	67
New England Center Hospital [1-3]	Boston	J. F. Sullivan	410	3	..	8	100

Numerical and other references will be found on pages 640 through 642.

10. NEUROLOGY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
Veterans Admin. Hospital [1-3]	Boston (Jamaica Plain)	F. A. Quadfasel	925	14	4	10	...
University Hospital [1-3-191]	Ann Arbor, Mich.	R. N. De Jong	784	17	4	14	160
Henry Ford Hospital [1-3]	Detroit	L. D. Proctor	389	18	1	3	250
University of Minnesota Hospitals							
Minneapolis General Hospital	Minneapolis	H. H. Noran	599	63	2	4	220
University Hospital [1-3-207]	Minneapolis	A. B. Baker	552	16	3	8	200
Veterans Admin. Hospital [1-3]	Minneapolis	R. C. Gray	674	18	2	2	...
Mayo Foundation	Rochester, Minn.	L. M. Eaton	3,865	39	6	18	175
Barnes Hospital [1-3]	St. Louis	J. L. O'Leary	741	21	2	4	75
Albany Medical School Affiliated Hospitals		F. Hesser	...	...	..	..	...
Albany Hospital [1-4]	Albany, N. Y.		444	8	2	5	160
Veterans Admin. Hospital [1-3]	Albany, N. Y.		284	15	1	1	...
Kings County Hospital							
Division II [1-3]	Brooklyn, N. Y.	A. M. Rabiner	1,678	55	2	6	105
Bellevue Hospital Center							
Div. II—Cornell University [1-3-287]	New York City	F. McDowell	483	26	1	4	105
Div. III—New York University College of Medicine [288]	New York City	M. Bender	500	8	4	11	105
Bronx Municipal Hospital Center [1-3]	New York City	S. R Korey	227	39	2	6	125
Montefiore Hospital [1-3]	New York City	T. Lawyer	660	28	4	7	167
Mount Sinai Hospital [1-3]	New York City	M. B. Bender	706	21	5	10	75
New York Hospital [1-3]	New York City	H. G. Wolff	Incl. in Int. Med.		..	1	161
Presbyterian Hospital (Neurological Institute) [1]	New York City	H. H. Merritt	2,815	30	10	15	250
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	T. W. Farmer	258	5	2	4	175
Duke Hospital [1-3]	Durham, N. C.	E. C. Kunkle	404	1	3	7	102
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	M. G. Netsky	286	7	1	3	333
University of Cincinnati College of Medicine Hospital Group		C. Aring	...	...	..	..	...
Cincinnati Gene[illegible]	Cincinnati		283	62	2	6	125
Veterans Admin. [illegible]	Cincinnati	C. Aring	177	16	..	1	...
Univers[illegible]	Cleveland	C. T. Randt	240	32	2	5	150
Hospita[illegible]vania [1-3]	Philadelphia	G. Gammon	492	11	3	8	100
Jefferso[illegible]	Philadelphia	B. J. Alpers	622	13	3	5	100
Philadel[illegible]	Philadelphia	A. Ornsteen	1,325	184	2	6	121
Baylor [illegible] Medic[illegible]		W. S. Fields	...	...	..	..	...
Jeffers[illegible]	Houston, Texas		119	11	..	1	75
Metho[illegible]	Houston, Texas		131	1	1	2	220
Veter[illegible]	Houston, Texas		483	21	1	3	...
Univers[illegible]tals							
De Goesbriand Memorial Hospital	Burlington, Vt.	H. Martin	100	3	1	2	167
Mary Fletcher Hospital [1-3]	Burlington, Vt.	G. Schumacher	256	5	1	3	250
University of Washington Affiliated Hospitals		F. Plum	...	...	..	..	...
King County Hospital Unit No. 1 (Harborview) [1]	Seattle		806	108	1	5	125
Veterans Admin. Hospital [1-3]	Seattle		160	12	..	..	...
University Hospitals [1-3]	Madison, Wis.	H. Reese	617	6	2	5	100

Residency programs in the following hospitals have been approved for TWO years of training by the Council and the American Board of Psychiatry and Neurology, through the Residency Review Committee for Psychiatry and Neurology. Applicants intending to qualify for examination by the American Board of Psychiatry and Neurology, Inc., should refer to the Board requirements that the candidate have had at least two of the three years of his training in a program or programs approved at the two or three year level.)

Hospitals, 21; Assistant Residencies and Residencies, 52

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
UNITED STATES ARMY							
Letterman Army Hospital [1-3]	San Francisco	W. Porter	393	1	2	2	...
Fitzsimons Army Hospital [1]	Denver	H. Collings, Jr.	188	...	1	2	...
UNITED STATES NAVY							
U. S. Naval Hospital [1-3]	Bethesda, Md.	J. E. Nardini	302	...	1	2	...
UNITED STATES PUBLIC HEALTH SERVICE							
National Institutes of Health-Clinical Center [1-3]	Bethesda, Md.	M. Shy	509	14	...	4	...
NONFEDERAL AND VETERANS ADMINISTRATION							
University of Alabama Medical Center							
Crippled Children's Hospital [1-3]	Birmingham, Ala.	W. S. Littlejohn	...	...	...	...	...
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	W. S. Littlejohn	95	...	1	2	108
Veterans Admin. Hospital [1-3]	Birmingham, Ala.	J. Tucker	122	5	1	1	...
Veterans Admin. Hospital [1-3-55]	Long Beach, Calif.	M. Feld	487	58	1	3	...
Veterans Admin. Hospital [1-3]	Oakland, Calif.	J. K. Smith	398	...	2	2	...
Veterans Admin. Hospital [1-3]	West Haven, Conn.	L. L. Levy	...	...	2	2	...
D[illegible] General Hospital [1-3]	Washington, D. C.	F. M. Forster-H. Stevens	608	13	2	4	233
W[illegible] of Medicine Affiliated Hospitals		J. S. Meyer	450	3	3	6	366
[illegible]	Detroit		...	...	...	...	...
Receiving Hospital [illegible]	Detroit		...	...	...	...	...
Buffalo General Hospital [1-3]	Buffalo	I. Hyman	190	1	1	1	175
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	B. H. Smith	258	1	1	2	247
Cleveland Clinic Hospital [1-3]	Cleveland	G. H. Williams	134	...	1	2	175
Ohio State University Hospitals							
University Hospital [1-3]	Columbus, Ohio	D. M. Palmer	Incl. in Int. Med.		1	2	177
University of Oklahoma Medical Center		S. Wolf-H. O'Neill	384	97	1	3	...
University Hospital [1-3]	Oklahoma City		...	...	...	..	175
Veterans Admin. Hospital [8]	Oklahoma City		...	...	...	..	...
University of Oregon Medical School Hospitals and Clinics [1-3-334]	Portland, Ore.	R. L. Swank	396	31	1	2	125
Veterans Admin. Hospital [1-348]	Pittsburgh	E Youngue	298	216	2	5	...
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	B. E. Sprofkin	Incl. in Int. Med.		1	2	250
Veterans Admin. Hospital [1-3]	Salt Lake City	M. H. Thomas	128	5	...	2	...
University of Virginia Hospital [1-3]	Charlottesville, Va.	T. R. Johns	288	6	2	3	200

Numerical and other references will be found on pages 640 through 642.

10. NEUROLOGY—Continued

Residency programs in the following hospitals have been approved for ONE year of training by the Council and the American Board of Psychiatry and Neurology, through the Residency Review Committee for Psychiatry and Neurology. (Applicants intending to qualify for examination by the American Board of Psychiatry and Neurology, Inc., should refer to the Board requirements that the candidate have had at least two of the three years of his training in a program or programs approved at the two or three year level.)

Hospitals, 26; Assistant Residencies and Residencies, 51

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
UNITED STATES NAVY							
U. S. Naval Hospital [1-3]	Philadelphia	J. F. McMullin	131	...	1	1	...
NONFEDERAL AND VETERANS ADMINISTRATION							
Veterans Admin. Hospital [1-3]	Los Angeles	R. Baker	426	7	1	1	...
White Memorial Hospital [1-3]	Los Angeles	L. B. Mann	175	4	1	1	215
George Washington University Hospital [1-3]	Washington, D. C.	J. W. Watts	706	25	1	2	150
Cook County Hospital	Chicago	W. R. Kirschbaum	1,444	17	2	2	140
Veterans Admin. Hospital [1-3]	Iowa City	M. W. Van Allen	412	13	1	1	...
Veterans Admin. Hospital [1-3]	Topeka, Kan.	M. R. Shaver	319	7	1	1	...
Massachusetts Memorial Hospital [1-3]	Boston	C. A. Kane	Incl. in Int. Med.		1	1	175
St. Louis City Hospital	St. Louis	W. Kempinsky—L. Tureen	553	70	1	2	200
Veterans Admin. Hospital [1-3]	Omaha, Neb.	F. A. Majka	245	21	1	2	...
Veterans Admin. Hospital [1-3]	East Orange, N. J.	W. O. Howard	466	36	1	1	...
Jewish Chronic Disease Hospital [1-3]	Brooklyn, N. Y.	A. M. Rabiner	541	33	2	4	175
Veterans Admin. Hospital [1-3]	Brooklyn, N. Y.	M. N. Margulies	252	15	1	1	...
Fordham Hospital [1-3]	New York City	J. H. Friedman	113	4	1	1	105
Goldwater Memorial Hospital New York University Division III [1-3]	New York City	I. S. Freiman	306	6	1	3	105
Lenox Hill Hospital [1-3]	New York City	A. Bell	357	10	1	1	180
New York Medical College—Metropolitan Medical Center Metropolitan Hospital [1-3]	New York City	I. Tarlov	150	1	1	3	105
Veterans Admin. Hospital (Bronx) [1-3]	New York City	W. Brown	436	16	2	5	...
Veterans Admin. Hospital (Manhattan) [1-3-255]	New York City	R. E. Peck	306	26	4	8	...
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	A. Tornay	303	9	2	2	...
Teaching Hospitals of the Medical College of South Carolina	Charleston, S. C	O. R. Talbert	134	2	1	1	137
Medical College Hospital			...	...	..	..	...
Roper Hospital			...	...	..	..	...
City of Memphis Hospital [1-3]	Memphis, Tenn.	N Gotten	60	1	1	2	150
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	T. Harris	Incl. in Psychiatry		1	1	160
Veterans Admin. Hospital [1-3]	Richmond, Va.	A. Davis	356	3	1	3	...

11. OBSTETRICS AND GYNECOLOGY

Residency programs in the following hospitals have been approved by the Council and the American Board of Obstetrics and Gynecology, as offering acceptable training in the specialty.

Hospitals, 482; Assistant Residencies and Residencies, 2,557

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES ARMY									
Letterman Army Hospital [1-3]	San Francisco	H. M. Jesurun	OBG	3,045	5	2	6	3	...
Fitzsimons Army Hospital [1-3]	Denver	J. H. Smith	OBG	2,619	6	2	6	3	...
Army Medical Center [1-3]	Washington, D. C.	H L. Riva	OBG	3,442	15	4	12	3	...
William Beaumont Army Hospital [3]	El Paso, Texas	A. K. Schoenbucher.	OBG	4,162	20	2	6	3	...
Brooke Army Hospital [1-3]	San Antonio, Texas	J. J. Young	OBG	2,937	2	3	9	3	...
Madigan Army Hospital [1-3]	Tacoma, Wash.	H. E. Harrison	OBG	3,310	2	2	6	3	...
Tripler Army Hospital [1-3]	Honolulu, T. H.	E. A. Zimmerman	OBG	5,707	3	2	6	3	...
UNITED STATES NAVY									
U. S. Naval Hospital [1-3]	Oakland, Calif.	R. W. Tandy	OBG	3,896	2	3	11	3	...
U. S. Naval Hospital [1]	San Diego, Calif.	W. S. Baker, Jr.	OBG	5,318	6	4	13	3	...
U. S. Naval Hospital [1-3]	Great Lakes, Ill.	R. A. Christenson.	OBG	2,322	..	2	5	3	...
U. S. Naval Hospital [1-3]	Bethesda, Md.	T. B. Lebherz	OBG	2,965	..	4	8	3	...
U. S. Naval Hospital [1-3]	Chelsea, Mass.	M. A. Godinez	OBG	1,859	..	2	4	3	...
U. S. Naval Hospital [1]	St. Albans, N. Y.	J. W. Huston	OBG	2,134	..	4	7	3	...
U. S. Naval Hospital [1-3]	Philadelphia	H. J Hunter	OBG	2,674	..	1	4	3	...
U. S. Naval Hospital [1-3]	Portsmouth, Va.	D. A. Callagan	OBG	6,717	5	4	10	3	...
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE									
Freedmen's Hospital [1-3]	Washington, D. C.	J. F. Clark	OBG	4,997	5	1	6	3	308
NONFEDERAL									
Carraway Methodist Hospital [1]	Birmingham, Ala.	T. M. Boulware	OB	2,674	1	1	1	1	250
University of Alabama Medical Center University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	W. N. Jones	OBG	6,889	3	4	9	3	108
Lloyd Noland Hospital [1-3-51]	Fairfield, Ala.	O. T. West	OBG	1,815	2	1	3	3	250
Good Samaritan Hospital [1]	Phoenix, Ariz.	C. Van Epps	OBG	3,727	2	..	2	1	300
Maricopa County General Hospital [1-3]	Phoenix, Ariz.	E. Sattenspiel	OBG	1,696	..	..	2	3	300
St. Joseph's Hospital [1-3]	Phoenix, Ariz.	Z. Campbell	OBG	6,251	1	1	3	3	250
University Hospital [1-3]	Little Rock, Ark.	W. E. Brown	OBG	4,542	7	4	13	3	155
Kern County General Hospital [1]	Bakersfield, Calif.	L. Smale	OBG	2,735	8	2	4	2	325
Herrick Memorial Hospital [1-3]	Berkeley, Calif.	F. E. Younge	OBG	2,486	..	1	1	1	175
San Joaquin General Hospital [1]	French Camp, Calif.	D. Harrington	OBG	2,118	1	1	3	3	200

Numerical and other references will be found on pages 640 through 642.

11. OBSTETRICS AND GYNECOLOGY—Continued

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
General Hospital of Fresno County [1-3]	Fresno, Calif.	H. L. Tieche	OBG	2,835	4	1	3	3	300
Glendale Sanitarium and Hospital [1]	Glendale, Calif.	J. B. Brown	OBG	2,650	2	1	2	2	325
Seaside Memorial Hospital [1-3-10]	Long Beach, Calif.	P. B. Hartley	OB	3,361	..	1	1	1	185
California Hospital [1-3]	Los Angeles	G. W. Hewitt	OBG	3,620	4	4	10	3	225
Cedars of Lebanon Hospital [1-3-59]	Los Angeles	L. Krohn-G. Rosenblum	OBG	4,750	4	2	5	3	265
Hospital of The Good Samaritan [1-3]	Los Angeles	S. M. Martins	OBG	3,436	3	1	3	3	250
Kaiser Foundation Hospital	Los Angeles	T. H. Baker	OBG	4,786	1	3	9	3	275
Los Angeles County Hospital [1]	Los Angeles	B. J. Hanley	OBG	24,785	42	4	16	3	246
Presbyterian Hospital-Olmsted Memorial [1-3]	Los Angeles	R. R. Herren-E. A. Pearson	OBG	2,441	..	3	5	3	200
Queen of Angels Hospital [1-3]	Los Angeles	R. F. Kelly	OBG	6,435	5	2	6	3	200
University of California Hospital [1-3-55-62]	Los Angeles	D. G. Morton	OBG	1,577	10	2	8	3	229
White Memorial Hospital [1-3-59]	Los Angeles	E. E. Nichols	OBG	2,810	3	2	6	3	215
Highland-Alameda County Hospital [1-3-72]	Oakland, Calif.	G. F. Calvin	OBG	3,825	9	2	6	3	200
Kaiser Foundation Hospital [1-3]	Oakland, Calif.	R. W. King	OBG	4,185	5	3	9	3	315
Mercy Hospital [1-3]	San Diego, Calif.	P. L. Martin	OBG	7,059	4	2	4	3	225
San Diego County General Hospital [1-3]	San Diego, Calif.	J. A. Rust	OBG	1,160	2	1	2	2	250
Children's Hospital [1-3]	San Francisco	D. A. Dallas	OBG	2,694	..	1	3	3	175
Kaiser Foundation Hospital [1-3]	San Francisco	H. B Nelson	OBG	3,753	11	2	6	3	200
Mary's Help Hospital [1-3]	San Francisco	C. L. Cooley	OBG	2,412	1	1	2	2	200
St. Francis Memorial Hospital [1-3]	San Francisco	C. D. Hart	OBG	2,558	1	3	3	1	300
St. Joseph's Hospital [1-3]	San Francisco	H. Von Geldern	OBG	1,852	..	1	1	1	300
St. Luke's Hospital [1-3]	San Francisco	J. Upton	OBG	1,942	1	1	3	2	325
St. Mary's Hospital [1-3]	San Francisco	P. H. Arnot	OBG	2,780	1	1	3	3	200
San Francisco Hospital-University of California Service [1]	San Francisco	E. C. Hill	OBG	1,398	7	2	3	1	205
Stanford University Affiliated Hospitals			OBG	.....	..	..	..	3	...
San Francisco Hospital Stanford University Service [1]	San Francisco	P. B. Hoffman	.....	1,407	6	3	4	..	205
[illegible] Hospital [1-3-70]	San Francisco	C. E. McLennan	.....	2,620	4	4	11	..	190
[illegible] San Mateo County [1]	San Mateo, Calif.	N. D. Morrison, Jr.	OBG	653	..	..	2	1	300
University of California Hospitals [3-78]	San Francisco	E. W. Page	OBG	2,517	4	4	12	3	231
Santa Clara County Hospital [1-3]	San Jose, Calif.	J. C. Muir	OBG	1,575	5	2	6	3	260
St. John's Hospital [1-3]	Santa Monica, Calif.	B. H. Watson	OBG	5,398	3	2	2	2	200
Harbor General Hospital [1]	Torrance, Calif.	D. G. Morton	OBG	3,291	11	3	7	3	216
Presbyterian Hospital [1-3]	Denver	M. C. Waddell	OBG	3,154	1	1	1	1	275
St. Joseph's Hospital [1-3]	Denver	W. W. Tucker	OBG	4,808	8	1	3	3	200
University of Colorado Medical Center			OBG	.....	..	..	..	3	...
Colorado General Hospital [1-3]	Denver	E. S. Taylor	.....	1,975	4	4	11	..	180
Denver General Hospital [1-3]	Denver	N. P. Isbell	.....	2,078	1	..	..	..	179
Bridgeport Hospital [1-3]	Bridgeport, Conn.	C. Griswold	OB	3,547	..	2	2	1	240
St. Vincent's Hospital [1-3]	Bridgeport, Conn.	F. Kinder	OB	4,023	1	2	4	2	300
Hartford Hospital [1-3]	Hartford, Conn.	L. F. Middlebrook	OBG	8,924	4	1	3	3	125
St. Francis Hospital [1-3]	Hartford, Conn.	F. X. Fagan	OBG	5,040	5	1	3	3	175
New Britain General Hospital [1-3]	New Britain, Conn.	D. A. Bristoll	OBG	2,360	1	1	3	3	210
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	C. L. Buxton-J. A. Florito	OBG	7,623	4	4	12	3	140
Hospital of St. Raphael	New Haven, Conn.	O. K. Johnson	OBG	4,222	3	2	5	3	150
Lawrence and Memorial Hospitals [1-3]	New London, Conn.	E. H. Blank	OBG	3,049	4	3	3	1	250
Norwalk Hospital [1-3]	Norwalk, Conn.	E. G. Norrington	OBG	2,619	..	1	1	1	195
Delaware Hospital [1-3-111]	Wilmington, Del.	S. W. Rennie	OBG	5,090	4	1	2	3	220
Columbia Hospital for Women and Lying-in Asylum [1-3]	Washington, D. C.	S. W. Hawken-H. J. R. McNitt	OBG	7,745	4	3	9	3	150
District of Columbia General Hospital [1-3]	Washington, D. C.	J. Parks-A. Marchetti	OBG	8,309	8	4	8	3	233
Doctors Hospital [1-3]	Washington, D. C.	J. K. Cromer	OBG	2,579	10	2	3	2	200
Georgetown University Hospital [1-3]	Washington, D. C.	A. A. Marchetti	OBG	4,702	4	3	7	3	175
George Washington University Hospital [1-3]	Washington, D. C.	R. Barter	OBG	6,397	6	2	6	3	150
Providence Hospital [3]	Washington, D. C.	G. Ellis	OBG	4,257	..	1	4	3	350
Sibley Memorial Hospital [1-3]	Washington, D. C.	M. Kaufman	OBG	3,293	1	1	3	2	200
Washington Hospital Center [1-3]	Washington, D. C.	W. D. Terrell	OBG	4,966	11	2	8	3	215
Duval Medical Center [1-3]	Jacksonville, Fla.	R. W. McDowell-D. M. Baldwin	OBG	2,687	3	2	4	3	150
St. Luke's Hospital [1-3]	Jacksonville, Fla.	R. W. McDowell	OBG	3,290	1	1	4	2	325
St. Vincent's Hospital [3]	Jacksonville, Fla.	J. L. Allgood-V. A. Hughes	OBG	4,406	..	2	4	3	225
Jackson Memorial Hospital [1-3]	Miami, Fla.	J. H. Ferguson	OBG	8,452	8	6	15	3	75
Mount Sinai Hospital of Greater Miami [1-3]	Miami Beach, Fla.	H. Kraff	OBG	1,309	..	1	2	2	250
St. Francis Hospital [1-3]	Miami Beach, Fla.	J. A. Heffernan	OBG	2,151	1	1	1	1	215
Orange Memorial Hospital [1]	Orlando, Fla.	F. M. Parish-R. L. Tolle	OBG	4,979	1	1	3	3	325
Mound Park Hospital [1-40]	St. Petersburg, Fla.	W. B. Estes	OBG	2,492	1	1	1	1	290
Tampa General Hospital [1]	Tampa, Fla.	C. G. Rorebeck	OBG	4,087	29	2	6	3	250
Crawford W. Long Memorial Hospital [1-3]	Atlanta, Ga.	R. K. Hancock	OBG	8,401	4	5	9	3	285
Georgia Baptist Hospital [1]	Atlanta, Ga.	E. D. Colvin	OBG	6,374	1	2	6	3	305
Grady Memorial Hospital [1]	Atlanta, Ga.	J. B. Cross	OBG	9,258	7	5	15	3	100
Piedmont Hospital [1-3]	Atlanta, Ga.	C. B. Upshaw	OBG	2,930	..	2	2	2	290
St. Joseph's Infirmary [1-3]	Atlanta, Ga.	W. V. Skiles	OBG	2,897	2	1	3	3	270
Medical College of Georgia Hospitals			OBG	.....	..	..	..	3	...
Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga.	R. Torpin	.....	187	..	4	12	..	250
University Hospital [1]	Augusta, Ga.	W. G. Watson	.....	4,593	25	1	3	..	200
Macon Hospital [1]	Macon, Ga.	E. Swilling-F. Houser	.....	6,039	3	1	3	..	250
Memorial Hospital of Chatham County [1-3]	Savannah, Ga.	H. C. Frech	OBG	1,512	5	1	2	2	350
Augustana Hospital [1-3]	Chicago	W. A. Boice	OB	1,288	1	2	2	1	150
Chicago Maternity Center [1-3-125]	Chicago	B. E. Tucker-H. B. Benaron	OB	3,885	..	3	11	1	150
Cook County Hospital	Chicago	A. Webster-F. H. Falls	OBG	26,172	32	10	20	3	140
Englewood Hospital [3]	Chicago	C. D. Krause	OB	2,317	..	1	1	1	200
Frank Cuneo Memorial Hospital	Chicago	A. Daro	OBG	2,050	..	1	2	1	150

Numerical and other references will be found on pages 640 through 642.

11. OBSTETRICS AND GYNECOLOGY—Continued

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First Year Residencies Offered [a]	Total Residencies Offered [a]	Length of Approved Program (Years)	Beginning Stipend (Month)
Grant Hospital [1-3]	Chicago	J. P. Fitz-Gibbons	OBG	2,231	5	1	2	2	225
Hospital of St. Anthony De Padua [1-3]	Chicago	J. J. Donlon	OB	1,747	1	2	2	1	250
Illinois Masonic Hospital [1-3]	Chicago	F. J. Roos	OBG	3,116	3	2	2	1	115
Lewis Memorial Maternity Hospital [1-3-126]	Chicago	H. E. Schmitz	OBG	4,434	9	6	14	3	75
Lutheran Deaconess Home and Hospital [3]	Chicago	A. D. Green	OB	1,608	..	1	1	1	200
Mercy Hospital [1-3-126]	Chicago	H. E. Schmitz	OBG	2,055	8	..	3	3	200
Michael Reese Hospital [1-3]	Chicago	L. Frankenthal	OBG	4,960	..	2	7	3	125
Mount Sinai Hospital [1-3]	Chicago	C. Fields	OBG	3,209	2	2	5	3	225
Northwestern University Medical Center									
Chicago Wesley Memorial Hospital [1-3]	Chicago	G. Gardner	OBG	3,390	2	2	7	3	125
Passavant Memorial Hospital [1-3]	Chicago	J. I. Brewer	OBG	2,235	1	2	4	3	125
Evanston Hospital [1-3]	Evanston, Ill.	D. N. Danforth	OBG	3,047	2	1	3	3	225
Presbyterian-St. Luke's Hospital									
Presbyterian Hospital Division	Chicago	H. Boysen	OBG	2,866	3	2	6	3	125
St. Luke's Hospital Division [1-3]	Chicago	E. A. Edwards	OBG	2,446	3	2	6	3	125
Provident Hospital [1-3]	Chicago	R. C. Stepto	OBG	3,211	22	2	5	3	200
St. Anne's Hospital [1-3]	Chicago	R. J. Hawkins	OB	3,762	..	6	6	1	250
St. Elizabeth Hospital [3]	Chicago	F. J. Walsh	OBG	3,607	..	1	3	1	200
St. Joseph Hospital [1-3]	Chicago	C. J. Geiger	OBG	1,919	..	1	3	3	300
Swedish Covenant Hospital	Chicago	G. L. Rosene	OB	1,861	2	2	2	1	240
University of Chicago Clinics [1-3]	Chicago	M. E. Davis	OBG	5,425	13	11	20	3	200
Billings Hospital			.....	.....	..	..	..	..	...
Chicago Lying-in Hospital and dispensary			.....	.....	..	..	..	..	...
University of Illinois Research and Educational Hospitals [1-3]	Chicago	W. F. Mengert	OBG	3,747	7	3	9	3	140
St. Francis Hospital [1]	Evanston, Ill.	J. X. Bremner	OBG	4,367	3	1	3	3	210
Little Company of Mary Hospital [1-3]	Evergreen Park, Ill.	P. E. Lawler-W. T. Carlisle	OBG	6,896	1	3	9	3	175
St. Francis Hospital	Peoria, Ill.	W. S. Miller	OBG	4,766	3	1	2	2	225
St. Anthony Hospital [1-3]	Rockford, Ill.	G. T. Burns	OBG	1,897	..	1	1	1	200
Indiana University Medical Center			.....	.....	..	4	16	..	...
Indianapolis General Hospital [1-3]	Indianapolis	C. F. Gillespie	OBG	4,267	10	..	..	3	205
Indiana University Medical Center Hospital [1]	Indianapolis	C. P. Huber	OBG	4,072	5	..	..	3	165
Methodist Hospital [1]	Indianapolis	L. Clark	OBG	9,245	9	2	4	3	278
St. Vincent's Hospital [1-3]	Indianapolis	P. F. Muller	OBG	3,650	1	1	3	3	275
St. Elizabeth Hospital [1-3]	Lafayette, Ind.	F. W. Peyton	OBG	2,760	..	2	3	2	275
State University of Iowa Hospitals [1-3]	Iowa City	J. H. Randall	OBG	2,849	7	3	9	3	175
University of Kansas Medical Center [1-3]	Kansas City, Kan.	L. A. Calkins	OBG	2,873	8	2	8	3	125
St. Francis Hospital [1-3]	Wichita, Kan.	L. E. Woodard	OBG	5,031	1	1	3	1	275
Wesley Hospital [1-3]	Wichita, Kan.	J. S. Menaker	OBG	5,510	..	1	1	1	310
St. Joseph Hospital [3]	Lexington, Ky.	J. B. Stith	OBG	1,455	..	1	3	1	230
Louisville General Hospital [1-3]	Louisville, Ky.	D. M. Haynes	OBG	4,030	2	3	9	3	105
St. Joseph Infirmary [1-3]	Louisville, Ky.	O. J. Hayes	OBG	4,894	4	1	3	3	210
Charity Hospital of Louisiana									
Independent Unit [1]	New Orleans	A. Jacobs	OBG	5,103	8	3	9	3	100
Louisiana State University Unit [1]	New Orleans	M. L. McCall	OBG	8,700	4	6	16	3	100
Tulane University Unit [1]	New Orleans	C. G. Collins	OBG	7,185	17	6	16	3	100
Hotel Dieu—Sister's Hospital	New Orleans	J. M. Brocato	OBG	3,786	1	2	2	1	225
Ochsner Foundation Hospital [1-3-154]	New Orleans	C. Tyrone	OBG	1,461	1	2	6	3	225
Southern Baptist Hospital [1-157]	New Orleans	J. Collins	OBG	7,544	1	2	6	3	225
Touro Infirmary [1]	New Orleans	W. E. Levy-C. G. Johnson	OBG	3,819	1	3	6	3	125
Confederate Memorial Medical Center [1]	Shreveport, La.	E. E. Dilworth	OBG	6,504	3	3	9	3	125
Baltimore City Hospitals [1-3]	Baltimore	P. E. Molumphy	OBG	6,302	7	6	18	3	75
Bon Secours Hospital [3]	Baltimore	H. B. McNally	OBG	3,246	..	1	4	3	300
Church Home and Hospital [1-3]	Baltimore	J. K. B. E. Seegar, Jr.	OB	1,212	..	..	1	1	200
Franklin Square Hospital [1-3]	Baltimore	I. A. Siegel	OBG	2,036	..	2	5	3	225
Hospital for Women [1-3]	Baltimore	J. E. Savage-J. D. Woodruff	OBG	5,275	..	8	13	3	220
Johns Hopkins Hospital [1-3]	Baltimore	N. J. Eastman-R. W. Te Linde	OBG	6,710	22	11	25	3	160
Lutheran Hospital [1-3]	Baltimore	W. N. Long, Jr.-W. K. Diehl	OBG	3,654	31	3	7	3	220
Maryland General Hospital [1-3-162]	Baltimore	D. M. Dixon-T. Kardash	OBG	3,305	22	2	6	3	225
Mercy Hospital [1-3]	Baltimore	J. J. Erwin-F. K. Morris	OBG	4,295	3	2	5	3	275
St. Agnes Hospital [1-3]	Baltimore	H. B. McNally-J. C. Dumler	OBG	2,846	..	3	6	3	260
St. Joseph's Hospital [3]	Baltimore	J. B. Boyle, Jr.-W. A. Dodd	OBG	2,484	2	2	4	3	225
Sinai Hospital [1-3]	Baltimore	I. A. Siegel-A. A. Sondheimer	OBG	5,631	3	4	10	3	110
South Baltimore General Hospital [1-3-163]	Baltimore	H. D. Beck-F. K. Morris	OB	1,048	..	2	5	2	150
Union Memorial Hospital [1-3-163]	Baltimore	J. M. Haws	OBG	2,310	1	1	3	3	215
University Hospital [1]	Baltimore	A. L. Haskins	OBG	5,222	5	6	15	3	75
Prince George's General Hospital [1-3]	Cheverly, Md.	J. F. Warren	OBG	3,993	3	2	6	3	200
Beth Israel Hospital [1-3]	Boston	H. H. Rosenfield	OB	2,966	..	2	4	2	167
Boston City Hospital [1-3]	Boston	B. Tenney, Jr.	OBG	5,510	5	6	16	3	132
Boston Lying-In Hospital [1-3]—Free Hospital for Women [1-3]	Boston	D. E. Reid-G. V. S. Smith	OBG	10,651	11	14	40	3	100
Carney Hospital [3]—St. Margaret's Hospital [1-3]	Boston	R. J. Heffernan-D. J. McSweeney	OBG	6,066	..	6	14	3	150
Massachusetts Memorial Hospitals [1-3-174]	Boston	L. Parsons	OBG	1,698	14	2	6	3	175
New England Center Hospital [1-3]	Boston	G. W. Mitchell, Jr.	GYN	384	4	1	2	2	100
New England Hospital [1-3]	Boston	M. A. Phillips	OB	1,558	..	2	3	2	85
St. Elizabeth's Hospital [1-3]	Boston	W. J. McDonald	OBG	5,083	..	1	3	3	125
Booth Memorial Hospital [1-3]	Brookline, Mass.	S. C. Kasdon	OB	598	..	2	2	1	200
Cambridge City Hospital [1-3]	Cambridge, Mass.	P. P. McGovern	OBG	2,427	2	1	3	3	160
St. Anne's Hospital [3]	Fall River, Mass.	E. F. Shay	OBG	2,128	3	1	1	1	200
Quincy Hospital [1-3]	Quincy, Mass.	L. H. Van Raalte	OBG	2,865	2	1	2	2	179

Numerical and other references will be found on pages 640 through 642.

11. OBSTETRICS AND GYNECOLOGY—Continued

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[8]	Length of Approved Program (Year)	Beginning Stipend (Month)
St. Joseph Mercy Hospital [1-3]	Ann Arbor, Mich.	W. Belser	OBG	2,854	1	2	4	3	310
University Hospital [1-3]	Ann Arbor, Mich.	N. F. Miller	OBG	4,316	26	3	12	3	160
Oakwood Hospital [1-3]	Dearborn, Mich.	M. S. Dennis	OBG	3,084	143	2	3	2	250
Crittenton General Hospital [3]	Detroit	H. B. Gaston	OBG	4,244	..	2	6	3	400
Detroit Memorial Hospital [1-3]	Detroit	H. F. Jarvis	OBG	2,485	29	1	4	3	425
Evangelical Deaconess Hospital [1-3]	Detroit	L. Braun	OBG	2,005	1	2	2	1	307
Grace Hospital [1-3]	Detroit	L. E. Bauer	OBG	8,636	..	4	12	3	275
Harper Hospital [1-3]	Detroit	H. C. Mack	OBG	4,985	2	3	7	3	275
Henry Ford Hospital [1-3]	Detroit	C. P. Hodgkinson	OBG	3,457	30	5	9	3	250
Mount Carmel Mercy Hospital [1-3]	Detroit	J. W. Pichette	OBG	9,017	4	2	8	3	275
Providence Hospital [1-3]	Detroit	H. Henderson	OBG	5,494	1	2	6	3	275
St. John Hospital [1-3]	Detroit	O. Morgan	OBG	5,710	1	2	6	2	325
St. Joseph Mercy Hospital [1]	Detroit	R. Walkowiak	OBG	2,879	..	1	3	3	310
Sinai Hospital [1-3]	Detroit	E. D. Rothman	OBG	3,707	1	2	5	3	275
Wayne University Affiliated Hospitals		C. S. Stevenson	OBG	.....	..	..	..	3	...
Herman Kiefer Hospital [1-3]	Detroit		.....	5,692	2	3	9	..	303
Receiving Hospital [1-3]	Detroit		.....	1,497	7	4	12	..	303
Woman's Hospital [1]	Detroit	C. S. Shelton-H. M. Nelson	OBG	6,535	7	3	12	3	475
Hurley Hospital [1-3]	Flint, Mich.	J. I. Collins	OBG	5,163	6	1	3	3	325
Blodgett Memorial Hospital [1-3]	Grand Rapids, Mich.	A. B. Thompson	OBG	3,647	2	1	2	2	300
Butterworth Hospital [1-3]	Grand Rapids, Mich.	E. Y. Postma	OBG	5,591	5	2	6	3	300
St. Mary's Hospital [1-3]	Grand Rapids, Mich.	C. F. Webb	OBG	3,936	1	1	3	3	275
Highland Park General Hospital [1-3]	Highland Park, Mich.	R. S. Siddall	OBG	3,410	1	1	3	3	308
Borgess Hospital [1-10]	Kalamazoo, Mich.	E. F. Hersey	OBG	2,654	2	1	2	1	275
Pontiac General Hospital [1-3]	Pontiac, Mich.	H. A. Furlong	OBG	4,387	..	2	5	3	325
St. Joseph Mercy Hospital [1-3]	Pontiac, Mich.	R. Adair	OBG	6,097	1	2	6	3	325
William Beaumont Hospital [1-3]	Royal Oak, Mich.	H. W. Longyear	OBG	4,108	3	2	4	2	300
Saginaw General Hospital [1-3]	Saginaw, Mich.	C. E. Toshach	OBG	3,192	1	1	3	3	365
Minneapolis General Hospital	Minneapolis	M. T. Mitchell	OBG	1,348	2	1	3	3	220
Northwestern Hospital [1-3]	Minneapolis	E. Ingalls	OBG	3,395	4	1	2	1	200
St. Barnabas Hospital [1-3]	Minneapolis	M. T. Mitchell	OBG	3,694	..	1	2	2	235
St. Mary's Hospital [3]	Minneapolis	E. C. Maeder	OBG	6,605	2	4	6	2	200
Swedish Hospital [1-3]	Minneapolis	R N. Frys	OBG	5,479	..	2	2	1	200
University of Minnesota Hospitals [1-3-208]	Minneapolis	J. L. McKelvey	OBG	1,988	7	4	12	3	209
Mayo Foundation	Rochester, Minn.	L. M. Randall	OBG	4,089	3	4	12	3	175
Ancker Hospital [1-3-25]	St. Paul	A. B. Hunt	OBG	1,068	1	1	1	1	220
Charles T. Miller Hospital [1-3]	St. Paul	P. T. Watson	OBG	3,108	1	..	1	1	250
St. Joseph's Hospital [1-3]	St. Paul	J. F. Melancon	OBG	3,279	1	..	2	3	250
University Hospital [1]	Jackson, Miss.	M. Newton	OBG	2,310	2	2	6	3	250
St. Louis County Hospital [1-3]	Clayton, Mo.	E. L. Dorsett	OBG	1,027	4	1	3	3	225
University of Missouri Medical Center [1-3]	Columbia, Mo.	J. S. Roden	OBG	675	3	1	3	3	200
Kansas City General Hospital No. 1 [1-3]	Kansas City, Mo.	R. G. Helman	OBG	1,916	3	1	4	3	200
Kansas City General Hospital No. 2 [1-3]	Kansas City, Mo.	H. L. Gainey	OBG	2,022	3	2	6	3	200
St. Joseph Hospital [1-3]	Kansas City, Mo.	G. L. Miller	OBG	4,100	5	1	3	2	250
St. Luke's Hospital [1-3]	Kansas City, Mo.	H. L. Gainey	OBG	4,143	3	2	4	3	310
Barnes Hospital [1-3]	St. Louis	W. Allen	OBG	6,908	3	4	20	3	50
De Paul Hospital [1-3]	St. Louis	E. G. Hamilton	OBG	4,039	1	1	2	2	200
Homer G. Phillips Hospital [1-3]	St. Louis	S. Monat	OBG	6,542	13	4	13	3	201
Jewish Hospital [1-3-222]	St. Louis	D. Rothman	OBG	3,145	1	1	4	2	150
Missouri Baptist Hospital [1-3]	St. Louis	G. Anstey	OBG	2,132	1	2	4	1	175
St. John's Hospital [1-3]	St. Louis	M. W. Weis	OB	3,265	..	2	2	1	200
St. Louis City Hospital [1-3-224]	St. Louis	A. T. Essinger-L. Hartnett	OBG	3,725	2	4	10	3	231
St. Luke's Hospital [1-3]	St. Louis	G. J. L. Wulff, Jr.	OBG	1,319	..	1	3	3	250
St. Mary's Group of Hospitals [1-3]	St. Louis	J. A. Hardy, Jr.	OBG	8,306	6	5	11	3	100
Lincoln General Hospital	Lincoln, Neb.	R. E. Garlinghouse	OBG	1,553	1	2	2	1	350
St. Elizabeth Hospital [1-3]	Lincoln, Neb.	S. T. Thierstein	OBG	3,362	..	1	3	3	350
Creighton University Medical Center	......	M. E. Grier	OBG	.....	..	..	..	3	...
Creighton Memorial-St. Joseph's Hospital	Omaha, Neb.	......	.....	3,926	5	2	5	..	210
St. Catherine's Hospital	Omaha, Neb.	......	.....	.....	..	..	..	..	...
Immanuel Hospital [1-3]	Omaha, Neb.	W. E. Kroupa	OBG	1,425	..	1	1	1	175
University of Nebraska Hospital [1-3-232]	Omaha, Neb.	R. G. Holly	OBG	1,303	4	2	5	3	200
Cooper Hospital [1-3]	Camden, N. J.	G. B. German-H. P. Shipps	OBG	5,677	2	3	4	3	200
Hackensack Hospital [1-3]	Hackensack, N. J.	R. C. Schretzmann	OB	3,071	..	2	2	1	150
Jersey City Medical Center	Jersey City, N. J.	E. N. Bookrajian	GYN	1,526	9	2	5	2	108
Margaret Hague Maternity Hospital [1-3]	Jersey City, N. J.	J. P. Donnelly	OB	11,624	94	13	21	3	...
Monmouth Memorial Hospital [1-3]	Long Branch, N. J.	W. Shanik	OB	2,259	1	1	1	1	200
Burlington County Hospital [1-3]	Mount Holly, N. J.	R. H Van Meter	OBG	1,709	..	1	3	3	100
Harrison S. Martland Medical Center [1-3]	Newark, N. J.	J. Pannullo-A. J. Gordon	OBG	3,630	4	2	6	3	162
Newark Beth Israel Hospital [1-3]	Newark, N. J.	A. Lowenstein	OBG	5,596	34	1	3	3	100
St. Michael's Hospital [1-3]	Newark, N. J.	G W. Hayes-O. Glass	OBG	4,303	2	2	4	3	165
Passaic General Hospital [1-3-10]	Passaic, N. J.	W. M. Sullivan	OBG	3,482	40	2	2	1	250
Paterson General Hospital [1-3]	Paterson, N. J.	L. E. Thron-P. Rauschenbach	OB	2,628	..	1	1	1	150
Holy Name Hospital [1-3]	Teaneck, N. J.	J. A Sullivan	OB	2,889	..	1	1	1	200
St. Francis Hospital [1-3]	Trenton, N. J.	J. R. Harman	OBG	3,647	..	1	2	2	210
Bernalillo County-Indian Hospital	Albuquerque, N. Mex.	R. V. Seligman	OBG	1,311	..	1	3	1	250
Albany Hospital [1-3-214]	Albany, N. Y.	R. E. L. Nesbitt, Jr.	OBG	5,069	6	3	10	3	160
A. N. Brady Hospital [3-215]	Albany, N. Y.	J. G. Hayes	OB	3,291	..	2	3	2	160
Beth El Hospital [1-3]	Brooklyn, N. Y.	W. Levine	OBG	4,884	3	4	9	3	150
Brooklyn Hospital [1-3]	Brooklyn, N. Y.	J. T. Wallace	OBG	2,848	2	1	3	3	175
Brooklyn Women's Hospital [1-3]	Brooklyn, N. Y.	J. Halperin	OBG	3,115	..	4	4	1	125
Coney Island Hospital [1-3]	Brooklyn, N. Y.	M. G. Der Brucke	OBG	1,244	2	..	4	3	105
Cumberland Hospital [1-3]	Brooklyn, N. Y.	C. H. Loughran	OBG	2,780	5	3	6	3	105
Greenpoint Hospital [1-3]	Brooklyn, N. Y.	S. Kaminester	OBG	2,682	..	2	6	3	105
Jewish Hospital [1-3]	Brooklyn, N. Y.	I. Daichman	OBG	6,711	2	2	8	3	100
Kings County Hospital Division II [1-3]	Brooklyn, N. Y.	L. M. Hellman	OBG	12,618	25	8	20	3	71
Long Island College Hospital [1-3]	Brooklyn, N. Y.	M. Glass	OBG	3,250	1	2	6	3	176
Lutheran Medical Center [1-3]	Brooklyn, N. Y.	A. S. MacGregor	OBG	2,657	..	1	3	3	125

Numerical and other references will be found on pages 640 through 642.

11. OBSTETRICS AND GYNECOLOGY—Continued

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First Year Residencies Offered*	Total Residencies Offered*	Length of Approved Program (Years)	Beginning Stipend (Month)
Maimonides Hospital [1-3]	Brooklyn, N. Y.	E. Solomons	OBG	5,015	1	2	8	3	75
Methodist Hospital [1-3]	Brooklyn, N. Y.	H. S. Acken, Jr.-S. C. Hall	OBG	3,922	2	2	8	3	175
St. Catherine's Hospital [1-3]	Brooklyn, N. Y.	W. C. Meagher	OBG	2,550	2	1	5	3	125
St. John's Episcopal Hospital [1-3]	Brooklyn, N. Y.	C. W. Mueller	OBG	2,883	1	1	3	3	175
St. Mary's Hospital [1-3]	Brooklyn, N. Y.	A. A. Schenone	OBG	2,478	2	1	3	3	200
Unity Hospital [1-3]	Brooklyn, N. Y.	M. Berlind	OBG	2,203	..	2	4	2	125
Wyckoff Heights Hospital [1-3]	Brooklyn, N. Y.	F. W. Benschine	OBG	2,546	1	1	3	1	100
Allied Hospitals of the Sisters of Charity [1-3]	Buffalo	E. G. Winkler	OBG	6,467	6	2	8	3	235
Emergency Hospital			.....	.....	..	..	..	..	...
Sisters of Charity Hospital			.....	.....	..	..	..	..	...
Buffalo General Hospital [1-3]	Buffalo	C. L. Randall	OBG	2,425	1	2	9	3	175
Deaconess Hospital [1-3]	Buffalo	H. Burwig	OBG	3,352	2	1	3	3	300
Edward J. Meyer Memorial Hospital [1-3-219]	Buffalo	E. G. Winkler	OBG	2,276	2	1	6	3	247
Millard Fillmore Hospital [1-3]	Buffalo	L. F. McLean	OBG	6,528	..	2	6	3	285
Mary Imogene Bassett Hospital [1-3]	Cooperstown, N. Y.	O. J. Severud	OBG	643	..	1	1	3	150
Elmhurst General Hospital [1-3]	Elmhurst, N. Y.	N. J. Schaiman-M. Rashbaum	OBG	2,682	..	4	9	3	105
Flushing Hospital and Dispensary [1-3]	Flushing, N. Y.	E. C. Veprovsky	OBG	4,957	1	1	3	3	175
Meadowbrook Hospital [1-3]	Hempstead, N. Y.	G. T. Lilly	OBG	2,281	10	1	4	3	225
Jamaica Hospital [1-3]	Jamaica, N. Y.	M. P. Bates	OBG	2,365	..	1	2	2	150
Mary Immaculate Hospital [1-3]	Jamaica, N. Y.	J. V. Rizzi	OB	2,644	..	1	1	1	160
Queens Hospital Center [1-3]	Jamaica, N. Y.	E. C. Veprovsky	OBG	3,397	11	1	3	3	105
Charles S. Wilson Memorial Hospital [1-3]	Johnson City, N. Y.	S. Nagyfy	OBG	3,051	5	2	4	3	225
North Shore Hospital [1-3]	Manhasset, N. Y.	W. F. Finn	OBG	2,205	1	2	4	3	200
Nassau Hospital [1]	Mineola, N. Y.	J. A. Mellow	OBG	4,759	1	1	3	3	325
Mount Vernon Hospital [1-3]	Mount Vernon, N. Y.	N. M. Weinrod	OBG	2,578	4	1	3	3	200
Long Island Jewish Hospital [1-3]	New Hyde Park, N. Y	A. H. Rosenthal	OBG	2,840	1	1	3	3	75
Bellevue Hospital Center Div. III—New York University College of Medicine [269]	New York City	G. Douglas	OBG	4,501	101	10	20	3	71
Beth Israel Hospital [1-3]	New York City	G. Blinick	OBG	2,964	3	3	6	3	155
Bronx Hospital [1-3]	New York City	A. C. Posner-A. J. Fleischer	OBG	3,109	1	2	6	3	100
Bronx Municipal Hospital Center [1-3]	New York City	S. L. Romney	OBG	1,796	1	4	10	3	125
Fordham Hospital [1-3]	New York City	M. L. Brandt	OBG	2,152	1	2	4	3	105
42nd Street Beth David Hospital [1-3]	New York City	M. D. Speiser	OBG	43	..	1	2	2	...
Francis Delafield Hospital [1-3-4]	New York City	H. C. Taylor, Jr.	GYN	294	31	..	5	1	105
French Hospital [1-3]	New York City	C. E. Heaton-H. C. Falk	OBG	1,918	..	2	4	3	110
Harlem Hospital [1-3]	New York City	A. C. Posner-M. L. Bobrow	OBG	6,532	8	2	6	3	105
Hospital For Joint Diseases [1-3]	New York City	E. L. Hecht	GYN	296	..	..	1	1	80
Jewish Memorial Hospital [1-3]	New York City	M. J. Goodfriend	OBG	2,333	1	1	1	1	150
Knickerbocker Hospital [1-3-4]	New York City	A. Decker	GYN	473	3	1	2	1	150
Lenox Hill Hospital [1-3]	New York City	J. C. Kilroe-M. W. Rodgers	OBG	2,881	1	1	3	3	180
Lincoln Hospital [1-3]	New York City	W. H. Godsick	OBG	5,107	2	3	7	3	105
Misericordia Hospital [1-3]	New York City	J. A. Kelly	OB	1,217	..	1	2	2	125
Morrisania City Hospital [1-3]	New York City	A. B. Tamis	OBG	2,424	2	1	4	3	105
Mount Sinai Hospital [1-3]	New York City	A. F. Guttmacher	OBG	7,377	1	12	18	3	75
New York Hospital [1-3]	New York City	R. G. Douglas	OBG	7,888	8	6	22	3	164
New York Infirmary [1-3]	New York City	I. Widenius-I. Knowlton	OBG	2,367	4	2	4	3	150
New York Medical College—Metropolitan Medical Center									
Flower and Fifth Avenue Hospitals [1-3]	New York City	M. L. Stone	OBG	3,716	..	1	3	3	100
Metropolitan Hospital [1-3]	New York City	M. L. Stone	OBG	5,291	12	4	12	3	105
New York Polyclinic Medical School and Hospital [1]	New York City	E. H. Dennen-H. H. Lardaro	OBG	2,144	6	2	6	3	125
New York University—Bellevue Medical Center University Hospital	New York City	G. Douglas	GYN	561	2	1	2	2	105
Presbyterian Hospital (Sloan Hospital For Women) [1]	New York City	H. C. Taylor	OBG	7,569	5	7	19	3	250
Roosevelt Hospital [1]	New York City	F. R. Smith	GYN	910	4	1	3	2	133
St. Clare's Hospital [1-3-250]	New York City	M. J. Jordan	OBG	2,120	4	2	6	3	200
St. Francis Hospital [1-3]	New York City	J. S. Labate	OBG	3,050	1	1	3	3	125
St. Vincent's Hospital [1-3]	New York City	B. J. Pisani	OBG	4,510	6	2	9	3	125
Sydenham Hospital	New York City	P. M. Murray	OBG	2,074	1	1	3	3	104
Woman's Hospital [1-3]	New York City	C. T. Javert	OBG	6,226	..	8	16	3	100
United Hospital [1-3]	Port Chester, N. Y.	C. N. Jeffries	OB	1,219	..	..	1	1	200
Genesee Hospital [1-3]	Rochester, N. Y.	A. J. Tatelbaum	OBG	3,483	5	2	4	3	175
Highland Hospital [1-3]	Rochester, N. Y.	D. H. Kariher	OBG	3,511	1	1	3	3	175
Rochester General Hospital [1-3]	Rochester, N. Y.	J. C. Potter	OBG	3,724	4	1	3	3	125
St. Mary's Hospital [1-3]	Rochester, N. Y.	F. Dobrzyinski	OBG	4,257	1	1	3	3	239
Strong Memorial—Rochester Municipal Hospital [1-3]	Rochester, N. Y.	C. J. Lund	OBG	4,502	..	4	8	3	117
Ellis Hospital [1-3]	Schenectady, N. Y.	W. Jameson, Sr.	OBG	3,018	1	2	5	2	150
General Hospital [1-3]	Syracuse, N.Y.	M. Hatch	OBG	2,697	..	2	4	2	217
St. Joseph's Hospital [1-3]	Syracuse, N. Y.	L. G. Fournier	OBG	3,605	1	1	2	1	267
State University of New York Upstate Medical Center [1-3]	Syracuse, N. Y.	E. C. Hughes-C. Clark	OBG	14,501	5	4	12	3	233
North Carolina Memorial Hospital [1-3-297]	Chapel Hill, N. C.	R. A Ross	OBG	854	1	3	10	3	175
Charlotte Memorial Hospital [1]	Charlotte, N. C.	J. H. E. Woltz	OBG	3,936	4	1	2	2	250
Duke Hospital [1-3]	Durham, N. C.	B. Carter	OBG	2,878	8	4	10	3	102
Lincoln Hospital [1-3]	Durham, N. C.	L. R. Swift	OBG	1,033	..	1	1	1	175
Watts Hospital [1-3]	Durham, N. C.	R. L. Pearse	OBG	2,654	1	1	2	1	300
Rex Hospital [1]	Raleigh, N. C.	R. Ruark	OBG	3,471	1	1	2	2	350
St. Agnes Hospital [1]	Raleigh, N. C.	C. D. Egerton	OBG	1,293	1	1	1	1	400
North Carolina Baptist Hospital [1-3]	Winston-Salem, N.C.	F. R. Lock	OBG	3,175	2	2	6	3	166
St. Luke's Hospital [3]	Fargo, N. Dak.	G. W. Hunter	OBG	2,004	..	1	1	3	204
Akron City Hospital [1-3]	Akron, Ohio	E. A. Riemenschneider	OBG	6,521	2	2	7	3	250
Akron General Hospital [1]	Akron, Ohio	N. E. Wentsler	OBG	5,202	..	2	8	3	250
St. Thomas Hospital [1-3]	Akron, Ohio	C. J. Paternite	OBG	3,415	12	2	5	3	250

Numerical and other references will be found on pages 640 through 642.

11. OBSTETRICS AND GYNECOLOGY—Continued

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Aultman Hospital [1-3]	Canton, Ohio	W. M. Dowlin	OBG	5,758	4	3	5	3	275
Mercy Hospital [1-3]	Canton, Ohio	N. Lewis	OBG	4,483	22	2	8	3	200
Bethesda Hospital [1-3]	Cincinnati	R. D. Bryant-R. Eddy	OBG	5,313	13	2	5	3	260
University of Cincinnati College of Medicine Hospital Group									
Cincinnati General Hospital [1-3]	Cincinnati	S. Garber-L. Bossert	OBG	5,447	1	2	8	3	100
Cleveland Clinic Hospital [1-3]	Cleveland	H. P. Taylor-J. S. Krieger	OBG	2,344	18	2	8	3	175
Cuyahoga County Hospital [1-3]	Cleveland	A. E. Bennett	OBG	4,117	..	3	12	3	162
Evangelical Deaconess Hospital [1-3]	Cleveland	J. E. Morgan	OBG	3,018	17	1	3	3	175
Fairview Park Hospital [1-3]	Cleveland	E. D. Richards	OBG	4,273	..	2	4	2	200
Huron Road Hospital [1-3]	Cleveland	S. E. Burkhart	OBG	3,909	2	2	6	3	210
Lutheran Hospital [1-3]	Cleveland	R. A. Schroeder	OBG	2,334	1	2	2	2	250
Mount Sinai Hospital [1-3]	Cleveland	J. Gross	OBG	5,121	2	3	7	3	215
St. Alexis Hospital [1-3]	Cleveland	J. E. Slivka	OB	1,561	..	2	2	1	250
St. Ann Hospital [1-3]	Cleveland	A. H. Dindia	OBG	4,034	..	2	4	2	250
St. John's Hospital [1-3]	Cleveland	R. P. Dreyer-G. R. Dickerhoff	OBG	3,136	2	2	5	2	225
St. Luke's Hospital [1-3]	Cleveland	G. B. Hurd	OBG	4,855	3	2	5	3	140
University Hospitals [1-3]	Cleveland	A. C. Barnes	OBG	7,054	42	3	12	3	150
Mount Carmel Hospital [1-3]	Columbus, Ohio	P. J. Reel-R. F. Daly	OBG	5,059	2	1	3	3	275
Ohio State University Hospitals University Hospital [1-3]	Columbus, Ohio	J. C. Ullery	OBG	6,817	8	3	12	3	177
White Cross Hospital [1-3-325]—St. Ann's Hospital for Women [1-3]	Columbus, Ohio	R. M. Inglis-Z. Hollenbeck	OBG	8,695	7	3	12	3	275
Good Samaritan Hospital [1-3]	Dayton, Ohio	N. J. Thompson	OBG	5,649	1	1	3	3	270
Miami Valley Hospital [1-3]	Dayton, Ohio	H. J. Staton	OB	6,090	2	1	1	1	200
Marymount Hospital [1-3]	Garfield Heights, Ohio	B. S. Malasky	OBG	2,531	..	2	2	1	200
Mercy Hospital [1-3]	Hamilton, Ohio	B. J. Lehmann	OBG	3,212	3	2	6	1	200
Lakewood Hospital [1-3]	Lakewood, Ohio	B. Wylie	OBG	3,714	1	3	3	1	200
Lima Memorial Hospital [1-3]	Lima, Ohio	M. A. Mulvania	OBG	2,666	..	2	3	2	275
St. Rita's Hospital [1-3]	Lima, Ohio	V. A. Noble	OBG	3,391	3	1	3	2	400
Maumee Valley Hospital [1-3]	Toledo, Ohio	J. Hillabrand	OB	708	..	1	1	1	285
Mercy Hospital [1-3]	Toledo, Ohio	R. O. King	OBG	3,918	1	1	3	3	275
St. Vincent's Hospital [1-3]	Toledo, Ohio	M. W. Diethelm	OBG	4,344	8	2	4	3	325
Toledo Hospital [1-]	Toledo, Ohio	O. E. Todd	OBG	4,597	2	1	3	3	275
Tru[illegible] Hospital [1]	Warren, Ohio	R. E. Meacham	OBG	3,967	..	1	2	2	300
St. [illegible]	Youngstown, Ohio	J. L. Scarnecchia	OBG	4,204	5	2	5	3	300
St. [illegible]	Oklahoma City	G. Rogers	OBG	5,572	2	1	3	3	300
Uni[illegible] Hospitals			OBG	.....	..	..	..	3	...
University Hospital [1-3]	Oklahoma City	M. J. Serwer-J. W. Kelso	.....	3,134	1	2	6	..	200
Wesley Hospital [1]	Oklahoma City	J. W. Records	.....	2,916	2	1	1	..	250
St. John's Hospital	Tulsa, Okla.	W. F. Thomas	OBG	6,397	1	2	6	3	175
Emanuel Hospital [1-3]	Portland, Ore.	G. H. Lage	OBG	7,709	24	2	6	3	275
University of Oregon Medical School Hospitals and Clinics [1-3]	Portland, Ore.	R. C. Benson	OBG	1,813	7	1	3	3	125
Abington Memorial Hospital [1-3]	Abington, Pa.	R. D. Porter-C. M. Turman	OBG	4,161	2	1	3	3	150
Allentown Hospital [1-]	Allentown, Pa.	F. C. Schaeffer	OBG	4,215	6	1	3	3	225
Altoona Hospital [1-3]	Altoona, Pa.	J. S. Taylor, Jr.	OBG	2,352	..	1	3	1	325
St. Luke's Hospital [1-3]	Bethlehem, Pa.	F. J. Pearson	OBG	3,054	17	1	2	2	225
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	R. E. Nicodemus	OBG	1,539	..	1	2	3	175
Thomas M. Fitzgerald Mercy Hospital	Darby, Pa.	J. V. Missett, Jr.	OBG	5,566	1	2	6	3	250
Harrisburg Hospital [1-3]	Harrisburg, Pa.	W. P. Dailey	OBG	5,175	2	2	4	3	250
Albert Einstein Medical Center									
Northern Division	Philadelphia	G. Weinstein	OBG	4,593	2	2	6	3	125
Southern Division [1-3]	Philadelphia	A. First	OBG	2,537	..	1	3	3	125
Chestnut Hill Hospital [1]	Philadelphia	Z. B. Newton	OBG	2,094	..	1	2	2	350
Episcopal Hospital [1-3]	Philadelphia	J. H. Dugger	OBG	3,131	1	1	3	3	150
Frankford Hospital [1-3]	Philadelphia	G. C. Hanna, Jr.	OBG	8,377	80	1	3	3	250
Germantown Dispensary and Hospital [1-3]	Philadelphia	Z. B. Newton	OBG	2,823	1	1	2	3	175
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	S. L. Israel	GYN	564	..	1	2	2	...
Hahnemann Medical College and Hospital [1-3]	Philadelphia	N. F. Paxson	OBG	3,401	8	3	9	3	75
Hospital of the University of Pennsylvania [1-3]	Philadelphia	F. L. Payne	OBG	5,888	11	5	15	3	125
Hospital of the Woman's Medical College of Pennsylvania [1-3]	Philadelphia	A. G. Taylor-M. D. Pettit	OBG	2,730	7	2	6	3	110
Jefferson Medical College Hospital [1-3]	Philadelphia	T. Montgomery-	OBG	6,031	12	2	8	3	100
		J. Montgomery	OBG	2,789	3	1	1	3	200
Lankenau Hospital [1-3]	Philadelphia	R. B. Wilson	OBG	1,188	1	1	2	1	200
Mercy-Douglass Hospital [1-3]	Philadelphia	H. O. Dickens	OBG	1,719	1	1	3	3	150
Methodist Episcopal Hospital [1-3]	Philadelphia	G. Hahn	OBG	2,512	4	1	4	3	250
Misericordia Hospital [1]	Philadelphia	J. E. Lynch	OBG	6,231	7	8	8	3	20
Pennsylvania Hospital [1-3]	Philadelphia	R. A. Kimbrough	OBG	7,445	17	3	9	3	121
Philadelphia General Hospital [1-3]	Philadelphia	J. Corbit	OBG	2,442	2	1	3	3	175
Presbyterian Hospital [1-3-310]	Philadelphia	J. C. Corbit	OBG	1,962	..	2	2	2	250
St. Mary's Hospital [3]	Philadelphia	M. A. Castallo	OBG	5,194	3	4	12	3	...
Temple University Hospital [1-3]	Philadelphia	J. R. Willson							
Woman's Hospital [3]	Philadelphia	A. G. Taylor-H. Angelucci	OBG	2,288	..	2	5	3	175
Health Center Hospitals of the University of Pittsburgh School of Medicine			OBG	.....	..	..	..	3	...
Elizabeth Steel Magee Hospital [1-3]	Pittsburgh	J. R. Eisaman-J. A. Hepp	.....	11,344	13	4	12	..	125
Mercy Hospital [1-3]	Pittsburgh	R. A. Gillis	OBG	3,433	1	1	3	3	235
		G. J. Carlin	OB	1,848	..	2	2	1	225
Montefiore Hospital [1-3]	Pittsburgh	W. J. Finegold	OBG	2,474	2	1	3	2	200
Pittsburgh Hospital [1-3]	Pittsburgh	E. A. Conti							
St. Francis General Hospital and Rehabilitation Institute [1-3]	Pittsburgh	J. H. Carroll-J. A. Hepp	OBG	3,122	7	2	4	3	225

Numerical and other references will be found on pages 640 through 642.

11. OBSTETRICS AND GYNECOLOGY—Continued

Name of Hospital	Location	Chief of Service	Residencies Approved	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
St Margaret Memorial Hospital [1-3]	Pittsburgh	R E Tafel O J. Eichhorn	OBG	1,441	2	1	1	2	300
South Side Hospital [1-3]	Pittsburgh	J New H Thomas	OBG	2,568	2	1	3	2	350
Western Pennsylvania Hospital [3]	Pittsburgh	A C Williamson	OB	2,171	2	1	1	1	225
Reading Hospital [1-3]	Reading, Pa	F. B Nugent	OBG	1,194	3	1	3	3	225
Providence Lying In Hospital	Providence, R I.	C S Houston	OB	10,155	4	3	3	1	125
Rhode Island Hospital [1-3]	Providence, R I	H C McDuff, Jr	GYN	1,209	4	2	4	2	125
Teaching Hospitals of the Medical College of South Carolina	Charleston, S C	L T Hester, Jr	OBG	4,435	9	3	7	3	137
Medical College Hospital			...	.		.	..	..	.
Roper Hospital		.....	...	..	.	.	..	..	..
Columbia Hospital of Richland County [1]	Columbia, S C	H H Fouche	OBG	3,926	2	1	3	3	175
McLeod Infirmary [1]	Florence, S C	R F. Zeigler	OBG	2,218	1	1	1	1	250
Greenville General Hospital [1]	Greenville, S C	W Hearin	OBG	5,668	5	1	3	3	250
Baroness Erlanger Hospital [1-3]	Chattanooga, Tenn	R G Demos	OBG	5,408	4	2	5	3	250
Memorial Hospital [1-3]	Chattanooga, Tenn	H E Jones	OBG	2,716	1	2	2	1	250
University of Tennessee Memorial Research Center and Hospital [1-3]	Knoxville, Tenn	A W Diddle	OBG	1,519	..	1	3	2	320
Baptist Memorial Hospital [1-3 352]	Memphis, Tenn	B E Everett	OBG	5,884	..	1	3	3	200
City of Memphis Hospitals [1-3]	Memphis, Tenn	P C Schreier	OBG	10,270	13	5	15	3	150
St Joseph Hospital [1-3]	Memphis, Tenn	H Feinstein	OBG	3,924	1	1	3	3	250
Baptist Hospital [1-3]	Nashville, Tenn	S C Cowan, Jr	OBG	5,130	1	2	4	3	300
George W. Hubbard Hospital [1-3]	Nashville, Tenn	W F B James	OB	1,408	..	2	5	2	150
Nashville General Hospital [1-3]	Nashville, Tenn	R L Chalfant	OBG	1,793	..	2	5	3	175
St Thomas Hospital [1-3-354]	Nashville, Tenn	R W Parker	OBG	2,583	.	1	3	2	300
Vanderbilt University Hospital [1-3]	Nashville, Tenn	F E Whitacre	OBG	2,410	3	3	12	3	50
Brackenridge Hospital [1-3]	Austin, Texas	M Turner	OBG	2,518	..	..	1	1	300
Baylor University Hospital [1-3]	Dallas, Texas	W K Strother, Jr	OBG	11,397	.	3	7	3	175
Methodist Hospital [1-3]	Dallas, Texas	S W. Cobb	OBG	5,651	.	2	4	3	200
Parkland Memorial Hospital [1-3]	Dallas, Texas	J A Pritchard	OBG	6,857	5	6	14	3	150
St Paul's Hospital [1-3]	Dallas, Texas	O V Prejean	OBG	7,006	7	2	4	3	150
Hotel Dieu Sisters Hospital [3]	El Paso, Texas	K S Kurita	OBG	1,757	1	1	2	2	150
Harris Hospital [1]	Fort Worth, Texas	A C Watson	OBG	7,912	..	1	3	1	300
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	G Jarvis	OBG	2,447	4	3	9	3	160
Baylor University College of Medicine Affiliated Hospitals									
Jefferson Davis Hospital [1-3]	Houston, Texas	S H Willis	OBG	5,342	10	4	8	3	75
Methodist Hospital [1-3]	Houston, Texas	H P Arnold J A Wall	OBG	4,165	4	..	4	3	220
Hermann Hospital [1-3]	Houston, Texas	T G Gready A M Faris	OBG	9,138	11	2	6	3	125
University of Texas Postgraduate School of Medicine Affiliated Hospitals									
St Joseph's Hospital [1 3]	Houston, Texas	J P Salerno	OBG	7,913	1		5	3	220
St Luke's Episcopal Hospital [1-3 40]	Houston, Texas	H L Gardner	OBG	4,310	2	3	3	1	220
University of Texas M D Anderson Hospital and Tumor Institute [1 3-4]	Houston, Texas	F Rutledge	GYN	598	25	.	3	1	300
Baptist Memorial Hospital [1-3]	San Antonio, Texas	J Worsham	OBG	6,375	2	1	2	2	150
Robert B Green Memorial Hospital [1-3]	San Antonio, Texas	G G Passmore	OBG	4,910	9	2	6	3	150
Thomas D Dee Memorial Hospital [1-364]	Ogden, Utah	A L Ward	OBG	3,443	.	1	3	3	325
Dr W H Groves Latter Day Saints Hospital [1-3]	Salt Lake City	C L Vance	OBG	7,436	2	2	4	2	250
Holy Cross Hospital [1 3]	Salt Lake City	M S Coombs	OBG	3,095	..	1	3	3	175
Salt Lake County General Hospital [3]	Salt Lake City	E G Holmstrom	OBG	941	1	..	3	3	220
University of Vermont Affiliated Hospitals		......	OBG	......	..	..	..	3	...
De Goesbriand Memorial Hospital	Burlington, Vt	W Slavin	..	1,671	2	1	3	..	167
Mary Fletcher Hospital [1 3 356]	Burlington, Vt	J V S Maeck	...	1,859	4	1	3	..	200
Alexandria Hospital [3]	Alexandria, Va	H Picot	OBG	4,735	2	2	2	2	275
Arlington Hospital [1-3]	Arlington, Va	J B Jacobs	OBG	3,372	.	2	2	1	215
University of Virginia Hospital [1-3]	Charlottesville, Va	W N Thornton, Jr	OBG	3,534	.	2	8	3	50
Riverside Hospital [1-3]	Newport News, Va	W J Baggs	OBG	2,872	1	1	2	3	250
De Paul Hospital [1-3]	Norfolk, Va	J R Kight	OBG	4,621	4	2	4	3	200
Norfolk General Hospital [1-3]	Norfolk, Va	M D Andrews B D Jones	OBG	4,900	3	2	4	3	215
Johnston Willis Hospital [1-3]	Richmond, Va	E Rucker	OBG	1,769	.	1	1	1	250
Medical College of Virginia — Hospital Division [1-3]	Richmond, Va	H H Ware, Jr R H Hoge	OBG	9,500	5	4	12	3	75
Doctors Hospital [1-3]	Seattle	W C Knudson	OBG	2,336	.	1	2	1	250
King County Hospital Unit No 1 (Harborview) [1]	Seattle	R R DeAlvarez	OBG	1,725	10	2	6	3	125
Providence Hospital [1-3]	Seattle	E T MacCamy	OB	2,966	1	1	1	1	215
Swedish Hospital [1-3]	Seattle	D Thorp	OBG	4,613	..	2	2	1	225
Virginia Mason Hospital [1-3]	Seattle	G G Rice	OB	2,671	.	1	1	1	150
Sacred Heart Hospital [3]	Spokane, Wash	D M Bush	OBG	5,421	5	1	3	3	250
St Luke's Hospital	Spokane, Wash	D W Robinson	OBG	1,680	.	1	1	1	225
Memorial Hospital [1-3]	Charleston, W Va	J L Crites	OBG	2,512	2	2	2	1	250
St Mary's Hospital [1-3-4]	Madison, Wis	G C Hank	OBG	3,246	..	1	1	1	225
University Hospitals [1-3 375]	Madison, Wis	B Peckham	OBG	877	6	2	8	3	100
Columbia Hospital [1]	Milwaukee	L T Servis	OB	1,477	..	2	2	1	245
Milwaukee County Hospital [1-3-390]	Milwaukee	B E Urdan	OBG	3,053	14	2	6	3	207
Milwaukee Hospital [1-3-377]	Milwaukee	F J Hofmeister	OBG	4,594	2	2	4	3	270
Mount Sinai Hospital [3]	Milwaukee	B E Urdan	OBG	3,673	.	1	3	1	300
St Joseph's Hospital [1-3]	Milwaukee	J A Klieger	OBG	7,141	2	2	6	3	230
St Luke's Hospital [1-3]	Milwaukee	J Evrard	OBG	1,876	6	3	3	1	275
St Mary's Hospital [1-3 370]	Milwaukee	D Werner- J D Owen	OBG	6,158	1	1	3	2	300
Gorgas Hospital [1]	Ancon, C Z	I J Strumpf	OBG	2,290	5	1	3	3	345
Kapiolani Maternity and Gynecological Hospital [1-3]— St Francis Hospital [1-3]	Honolulu, T. H	F. Carty E Matsuoka	OBG	8,091	..	3	7	3	150
Queen's Hospital [1-3]	Honolulu, T H.	R Sakimoto	OBG	3,561	1	2	3	2	150
Bayamon Charity District Hospital [1-3]	Bayamon, P. R	E Arandes	OBG	2,795	8	2	3	1	250
Ponce District General Hospital [1]	Ponce, P. R	A. H Torres	OBG	2,020	6	1	1	1	250
San Juan City Hospital [1-3]	San Juan, P. R	R. Gil	OBG	6,128	8	3	9	3	150

Numerical and other references will be found on pages 640 through 642.

12. OCCUPATIONAL MEDICINE

The programs in Occupational Medicine which have been approved by the Council and the American Board of Preventive Medicine through the Residency Review Committee for Preventive Medicine, will be found listed under Preventive Medicine, page 613

13. OPHTHALMOLOGY

Residency programs in the following hospitals have been approved by the Council and the American Board of Ophthalmology through the Residency Review Committee for Ophthalmology, as offering acceptable training in the specialty.

Hospitals, 166; Assistant Residencies and Residencies, 724

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES ARMY								
Letterman Army Hospital [1-3]	San Francisco	R. Kelley	989	20,103	2	6	3	...
Fitzsimons Army Hospital [1-3]	Denver	J. W. Passmore	278	13,627	1	3	3	...
Army Medical Center [1-3]	Washington, D. C.	A. [illegible], Jr.	524	30,818	3	9	3	...
Brooke Army Hospital [1-3]	San Antonio, Texas	W. [illegible]	466	16,354	2	6	3	...
UNITED STATES NAVY								
U. S. Naval Hospital [1-3]	Oakland, Calif.	K. J. Palmberg	366	7,286	1	1	3	...
U. S. Naval Hospital [1]	San Diego, Calif.	R. P. Nadbath	408	17,923	2	5	3	...
U. S. Naval Hospital [1-3]	Bethesda, Md.	S. J. Ryan	1,055	6,197	2	3	3	...
U. S. Naval Hospital [1]	St. Albans, N. Y.	D. A. Mills	173	5,278	1	1	3	...
U. S. Naval Hospital [1-3]	Philadelphia	W. L. Smith	310	7,490	1	4	3	...
UNITED STATES PUBLIC HEALTH SERVICE								
U. S. Public Health Service Hospital [1-3]	San Francisco	W. W. Richards	130	3,486	1	1	3	...
U. S. Public Health Service Hospital [1-3]	New Orleans	W. E. Hoyle	146	5,294	..	3	3	...
U. S. Public Health Service Hospital [1-3]	Baltimore	W. P. Griffey	140	4,018	1	3	3	...
U. S. Public Health Service Hospital [1-3]	Stapleton, S. I., N. Y.	J. B. Peebles	252	5,737	1	3	3	...
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE								
Freedmen's Hospital [1-3]	Washington, D. C.	C. L. Cowan	85	3,111	1	2	3	308
NONFEDERAL AND VETERANS ADMINISTRATION								
University of Alabama Medical Center			.....	......	..	..	3	...
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	S. J. Kelley-C. P. Grant	901	6,747	1	6	..	108
Veterans Admin. Hospital [2-3]	Birmingham, Ala.	R. B. Burroughs	73	232	1	1	..	...
Veterans Admin. Hospital [1]	Tuskegee, Ala.	H. G. Dwiggins	134	598	1	3	3	...
Arkansas Baptist Hospital [1-3]	Little Rock, Ark.	R. C. Cook	587	......	1	3	3	325
General Hospital of Fresno County [1-3]	Fresno, Calif.	R. J. Eckdahl	164	5,345	1	2	2	300
Veterans Admin. Hospital [1-3]	Long Beach, Calif.	G. C. Struble	222	2	1	3	3	...
Los Angeles County Hospital [1]	Los Angeles	W. Endres	890	25,788	2	6	3	246
Los Angeles Eye and Ear Hospital [1-3-56]	Los Angeles	O. H. Ellis	334	5,726	3	6	2	160
University of California Hospital [1-3]	Los Angeles	S. R. Irvine	290	5,833	1	3	3	229
Veterans Admin. Hospital [1-3]	Los Angeles	C. S. Mumma	468	10,763	..	2	3	...
White Memorial Hospital [1-3]	Los Angeles	S. B. Brownsberger	290	8,662	1	2	3	215
Highland—Alameda County Hospital [1-3]	Oakland, Calif.	M. E. Gump	253	5,782	1	2	3	200
Stanford University Hospitals [1-3-78]	San Francisco	D. K. Pischel	551	7,977	1	3	3	100
University of California Hospitals [3-79]	San Francisco	F. C. Cordes	547	12,410	4	12	3	231
Veterans Admin. Hospital [1-3]	San Francisco	M. Fine-D. O. Harrington	317	1,359	1	3	3	...
Harbor General Hospital [1]	Torrance, Calif.	S. R. Irvine	198	5,743	1	3	2	246
University of Colorado Medical Center			.....	......	..	..	3	...
Colorado General Hospital [1-3]	Denver	J. C. Long	176	13,242	2	6	..	180
Denver General Hospital [1-3]	Denver	G. A. Filmer	73	1	..	..	..	179
Grace—New Haven Community Hospital [1-3]	New Haven, Conn.	R. M. Fasanella	590	6,509	1	3	3	140
District of Columbia General Hospital [1-3]	Washington, D. C.	E. Cummings-R. A. Cox	155	4,977	1	2	2	233
Georgetown University Medical Center			.....	......	..	..	3	...
Georgetown University Hospital [1-3]	Washington, D. C.	E. J. Cummings	488	4,220	1	3	..	175
Veterans Admin. Hospital [1-3]	Washington, D. C.		.....	......	..	..	..	...
Washington Hospital Center [1-3-121]	Washington, D. C.	G. V. Simpson	2,416	33,368	3	7	3	215
Jackson Memorial Hospital [1-3]	Miami, Fla.	E. Norton	645	7,223	2	6	3	75
Grady Memorial Hospital [1]	Atlanta, Ga.	F. P. Calhoun, Jr.	584	18,010	2	6	3	100
Medical College of Georgia Hospitals			.....	......	..	..	3	...
Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga.	J. Fair	134	798	1	2	..	250
Chicago Eye, Ear, Nose and Throat College and Hospital	Chicago	O. B. Nugent	361	11,473	3	5	2	100
Cook County Hospital	Chicago	T. N. Zekman	542	16,103	3	7	2	140
Illinois Eye and Ear Infirmary [1-3]	Chicago	(See University of Illinois Hospitals)						
Michael Reese Hospital [1-3]	Chicago	T. M. Shapira	944	5,875	2	4	2	125
Northwestern University Medical Center			.....	......	..	..	3	...
Chicago Wesley Memorial Hospital [1-3]	Chicago	W. A. Mann	364	......	1	2	..	125
Passavant Memorial Hospital [1-3]	Chicago	D. Vail	426	500	2	2	..	125
Veterans Admin. Research Hospital [1-3]	Chicago	D. Vail	175	5,686	..	2	..	...
Presbyterian-St. Luke's Hospital								
Presbyterian Hospital Division [1-3]	Chicago	W. F. Hughes, Jr.	291	......	1	2	2	125
St. Luke's [illegible]	Chicago	E. H. Merz	367	1,558	1	2	2	125
University o[illegible]	Chicago	F. W. Newell	376	7,967	1	3	3	200
University of [illegible]		W. F. Hughes	.....	......	..	..	3	...
Illinois Eye [illegible]	Chicago		1,479	61,912	6	18	..	140
Research and Educational Hospitals [1-3]	Chicago		322	9,676	2	3	..	140
Evanston Hospital [1-3]	Evanston, Ill.	G. R. Soper	155	1,364	..	1	2	227
Veterans Admin. Hospital [1-3]	Hines, Ill.	W. A. Mann	340	320	2	4	2	...
Indiana University Medical Center			.....	......	4	12	3	...
Indianapolis General Hospital [1-3]	Indianapolis	M. Bartley	211	9,268	..	..	..	205
Indiana University Medical Center Hospital [1]	Indianapolis	F. M. Wilson	297	7,439	..	..	..	165
State University of Iowa Hospitals [1-3]	Iowa City	A. E Braley	1,535	5,264	2	6	3	175
University of Kansas Medical Center [1-3]	Kansas City, Kan.	A. Lemoine, Jr.	653	5,108	1	3	3	125
University of Louisville Medical Center		C. D. Townes	.....	......	..	..	..	...
Louisville General Hospital [1-3]	Louisville, Ky.		113	7,047	1	4	..	63
Veterans Admin. Hospital [1-3]	Louisville, Ky.		132	1,627	..	..	..	...

Numerical and other references will be found on pages 640 through 642.

13. OPHTHALMOLOGY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered [a]	Total Residencies Offered [a]	Length of Approved Program (Years)	Beginning Stipend (Month)
Charity Hospital of Lousiana								
Louisiana State University Unit [1]	New Orleans	G. M. Haik	450	7,627	2	4	3	100
Tulane University Unit [1]	New Orleans	J. H. Allen	575	6,535	2	4	3	100
Eye, Ear, Nose and Throat Hospital [1-3]	New Orleans	W. M. Boles	1,471	15,351	..	10	3	125
Veterans Admin. Hospital [1-3-155]	New Orleans	J. H. Allen	113	......	1	2	3	...
Baltimore Eye, Ear and Throat Hospital [1-3]	Baltimore	M. L. Small	1,335	13,924	1	3	3	150
Johns Hopkins Hospital [1-3]	Baltimore	A. E. Maumenee	2,105	17,224	4	14	3	217
Veterans Admin. Hospital [1-3-162]	Fort Howard, Md.	H. A. Naquin	66	127	..	1	3	...
Boston City Hospital [1-3]	Boston	D. R. Alpert	449	19,597	..	7	3	152
Massachusetts Eye and Ear Infirmary [1-3]	Boston	E. B. Dunphy	4,052	44,108	5	13	3	42
Massachusetts Memorial Hospitals [1-3]	Boston	T. Gundersen	260	3,492	1	3	2	175
University Hospital [1-3-191]	Ann Arbor, Mich.	F. B. Fralick	784	15,645	6	18	3	160
Harper Hospital [1-3]	Detroit	A. D. Ruedemann, Sr.	1,459	5,300	1	3	3	275
Henry Ford Hospital [1-3]	Detroit	J. S. Guyton	735	22,939	6	17	3	250
Wayne University Affiliated Hospitals		A. D. Ruedemann, Sr.	.....	......	..	..	3	...
Veterans Admin. Hospital [1-3]	Dearborn, Mich.	....	120	145	..	1	..	...
Receiving Hospital [1-3]	Detroit	....	890	23,973	5	15	..	303
Minneapolis General Hospital	Minneapolis	K. E. Sandt	144	3,424	1	2	3	220
University of Minnesota Hospitals [1-3-206]	Minneapolis	E. W. Hansen	174	6,249	1	3	3	209
Veterans Admin. Hospital [1-3-214]	Minneapolis	E. W. Hansen	149	......	3	3	3	...
Mayo Foundation	Rochester, Minn.	C. W. Rucker	773	38,500	6	18	3	175
Ancker Hospital [1-3]	St. Paul	H. Plotke	131	4,105	..	1	3	220
Charles T. Miller Hospital [1-3]	St. Paul	A. F. Adair	773	1,075	..	2	3	250
University of Mississippi Medical Center		....	.....	......	..	..	3	...
University Hospital [1]	Jackson, Miss.	S. Johnson	61	614	..	2	..	250
Veterans Admin. Hospital [1-3]	Jackson, Miss.	L. L. Mayer	1,562	783	..	..	..	...
Kansas City General Hospital No. 1 [1-3]	Kansas City, Mo.	S. Kantor	746	4,192	1	3	2	200
Barnes Hospital [1-3]	St. Louis	B. Becker	2,192	3	5	16	3	50
Homer G. Phillips Hospital [1-3]	St. Louis	B. Becker	151	5,163	2	6	3	201
St. Louis City Hospital [1-3]	St. Louis	D. Bisno	195	7,069	1	3	3	234
St. Mary's Group of Hospitals [1-3]	St. Louis	R. D. Mattis	242	7,059	1	3	3	100
Veterans Admin. Hospital [1-3]	St. Louis	H. Rosenbaum	165	2,163	1	3	3	...
University of Nebraska Hospital [1-3]	Omaha, Neb.	J. H. Judd	135	3,423	1	2	3	200
Jersey City Medical Center	Jersey City, N. J.	F. X. Brophy	245	......	1	3	3	108
United Hospitals of Newark								
Newark Eye and Ear Infirmary Unit [1-3]	Newark, N. J.	W. H. Hahn	1,278	9,303	..	2	3	125
Brooklyn Eye and Ear Hospital [1-3]	Brooklyn, N. Y.	M. J. Buonaguro	3,039	44,030	4	8	2	100
Jewish Hospital [1-3]	Brooklyn, N. Y.	M. Lasky	182	3,834	1	3	2	100
Kings County Hospital Division II [1-3]	Brooklyn, N. Y.	R. Troutman	497	17,165	4	8	3	105
Veterans Admin. Hospital [1-3]	Brooklyn, N. Y.	M. A. Lasky	140	......	1	2	2	...
Buffalo General Hospital [1-3]	Buffalo	I. J. Koenig	304	1,396	1	2	2	175
Edward J. Meyer Memorial Hospital [1-3-247]	Buffalo	W. Y. Jones	141	4,407	1	5	2	247
Elmhurst General Hospital [1-3]	Elmhurst, N. Y.	J. Sauer	107	7,070	1	3	2	105
Queens Hospital Center [1-3]	Jamaica, N. Y.	T. D Angelo	179	3,110	1	2	2	105
Bellevue Hospital Center Div. IV—New York University Post-Graduate Medical School [1-3-240]	New York City	A. G. De Voe	944	24,983	4	12	3	71
Bronx Eye and Ear Infirmary [3]	New York City	S. Epstein-F. La Gattuta	1,001	14,679	1	2	2	100
Bronx Municipal Hospital Center [1-3]	New York City	M. Chamlin	66	4,956	1	3	3	125
Goldwater Memorial Hospital [1-3]	New York City	S. Fox	2,115	290	2	3	2	105
Harlem Eye and Ear Hospital [1-3]	New York City	P. Muller	598	13,695	1	2	2	100
Lenox Hill Hospital [1-3]	New York City	B. F. Payne	354	4,909	1	2	3	180
Manhattan Eye, Ear and Throat Hospital [1-3]	New York City	R. T. Paton	3,019	52,591	5	10	2	100
Montefiore Hospital [1-3]	New York City	S. Gartner	212	1	1	2	2	187
Mount Sinai Hospital [1-3]	New York City	J. Laval	269	9,415	1	2	3	75
New York Eye and Ear Infirmary [1-3]	New York City	B. F. Payne	3,615	57,652	6	18	3	50
New York Hospital [1-3]	New York City	J. McLean	732	12,003	2	6	3	164
New York Polyclinic Medical School and Hospital [1]	New York City	S. Schutz	327	5,829	1	3	2	125
New York University—Metropolitan Medical Center								
Metropolitan Hospital [1-3]	New York City	C. A. Turtz	125	9,519	1	2	2	105
Presbyterian Hospital (Institute of Ophthalmology) [1]	New York City	J. H. Dunnington	2,895	26,978	3	9	3	250
St. Luke's Hospital [1-3]	New York City	H. Eggers	218	5,772	1	2	2	100
St. Vincent's Hospital [1-3]	New York City	R. Castroviejo	372	5,202	1	3	3	125
Veterans Admin. Hospital (Bronx) [1-3]	New York City	A. Haft	323	3,569	1	3	3	...
Veterans Admin. Hospital (Manhattan) [1-3]	New York City	B. L. Spitz	248	......	1	3	3	...
St. Mary's Hospital [1-3]	Rochester, N. Y.	C. Sullivan	372	......	1	1	2	230
Strong Memorial—Rochester Municipal Hospital [1-3]	Rochester, N. Y.	J. F. Gipner	421	3,582	1	2	3	117
State University of New York Upstate Medical Center [1-3]	Syracuse, N. Y.	J. McGraw	458	3,229	1	3	2	233
Grasslands Hospital [1-3]	Valhalla, N. Y.	C. Wood	91	4,420	1	3	3	175
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	S. D. McPherson	72	2,428	..	2	3	175
Duke University Affiliated Hospitals		W. B. Anderson	.....	......	..	..	3	...
Duke Hospital [1-3]	Durham, N. C.	....	575	7,657	2	6	..	127
Veterans Admin. Hospital [1-3]	Durham, N. C.	....	169	......	..	2	..	...
McPherson Hospital [1-3]	Durham, N. C.	S. D. McPherson, Jr.	752	23,376	1	3	3	200
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	R. W. Roberts	267	3,772	1	3	3	166
University of Cincinnati College of Medicine Hospital Group								
Cincinnati General Hospital [1-3-309]	Cincinnati	D. Lyle	302	7,325	2	5	2	50
Cleveland Clinic Hospital [1-3]	Cleveland	R. J. Kennedy	405	19,429	2	6	3	175
Cuyahoga County Hospital [1-3]	Cleveland	R. J. Nicholl	132	5,054	2	4	3	162
St. Luke's Hospital [1-3-315]	Cleveland	G. T. Schwarz	401	4,402	1	1	2	140
University Hospitals [1-3]	Cleveland	L. V. Johnson	824	7,400	2	6	3	150
Veterans Admin. Hospital [1-3]	Cleveland	W. P. Chamberlain	276	......	1	2	2	...
Ohio State University Hospitals								
University Hospital [1-3]	Columbus, Ohio	W. H. Havener	411	8,948	4	12	3	177
University of Oklahoma Hospitals [1-3]	Oklahoma City	J. R. Reed	414	4,784	1	3	2	200
University of Oregon Medical School Hospitals and Clinics [1-3-334]	Portland, Ore.	K. C. Swan	555	9,874	2	6	3	125
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	I. Leopold	866	1,933	2	6	3	...

Numerical and other references will be found on pages 640 through 642.

13. OPHTHALMOLOGY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Hospital of the University of Pennsylvania [1-3]	Philadelphia	F. H. Adler	844	5,008	3	9	3	100
Jefferson Medical College Hospital [1-3]	Philadelphia	C. R. Mullen	212	4,424	1	3	3	100
Philadelphia General Hospital [1-3]	Philadelphia	T. Cowan	232	7,313	1	4	3	121
Temple University Hospital [1-3-342]	Philadelphia	G. G. Gibson	346	3,895	1	4	3	...
Wills Eye Hospital [1-3]	Philadelphia	......	5,144	87,904	7	14	2	100
Health Center Hospitals of the University of Pittsburgh School of Medicine		......	......	......	..	..	3	...
Eye and Ear Hospital [1-3]	Pittsburgh	M. F. McCaslin	2,548	11,146	2	7	..	125
Montefiore Hospital [1-3]	Pittsburgh	H. Thorpe	610	3,407	1	3	3	225
Veterans Admin. Hospital [1-3]	Pittsburgh	R. N. Lehman	302	......	2	6	3	...
Teaching Hospitals of the Medical College of South C[illegible]		P. G. Jenkins	354	1,290	1	2	2	137
Medical Co[illegible]		......	......	......	..	..	..	...
Roper Ho[illegible]		......	......	......	..	..	..	...
City of M[illegible]								
[illegible] Nose and Throat Hospital [1-3]	Memphis, Tenn.	P. M. Lewis	10,859	13,322	2	6	3	150
Veterans Admin. Hospital [1-3]	Memphis, Tenn.	A. C. Krause	652	5	1	1	3	...
Parkland Memorial Hospital [1-3]	Dallas, Texas	C. K. Browning	305	4,137	2	5	3	150
Veterans Admin. Hospital [1-3-557]	Dallas, Texas	S. Gostin	318	......	1	2	3	...
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	G. Robertson	359	4,906	1	3	3	160
Baylor University College of Medicine Affiliated Hospitals								
Jefferson Davis Hospital [1-3]	Houston, Texas	E. L. Goar	195	92,820	2	6	2	75
Veterans Admin. Hospital [1-3]	Houston, Texas	L. J. Girard	353	647	2	6	3	...
Hermann Hospital [1-3]	Houston, Texas	T. L. Royce	674	1,981	1	3	3	125
Scott and White Memorial Hospitals [1-3]	Temple, Texas	E. R. Veirs	468	8,037	1	1	2	300
University of Virginia Hospital [1-3]	Charlottesville, Va.	E. W. Burton	379	3,902	2	4	3	50
Medical College of Virginia—Hospital Division [1-3]	Richmond, Va.	D. Guerry, III	405	7,617	1	3	3	75
Veterans Admin. Hospital [1-3]	Richmond, Va.	E. W. Perkins	351	2,624	1	3	3	...
Gill Memorial Eye, Ear and Throat Hospital	Roanoke, Va.	E. G. Gill	1,586	17,985	3	3	..	350
King County Hospital Unit No. 1 (Harborview) [1]	Seattle	R. C. Laughlin	126	......	..	1	2	125
University Hospitals [1-3]	Madison, Wis.	P. Duehr	506	2,384	1	4	3	100
Milwaukee County Hospital [1-3]	Milwaukee	E. F. Carl	545	8,456	1	3	3	207
Veterans Admin. Hospital [1-3-378]	Milwaukee (Wood), Wis.	R. H. Lehman-J. B. Hitz	310	3,811	1	3	3	...
Gorgas Hospital [1]	Ancon, C. Z.	R. H. Rupp	138	6,795	1	2	3	345
San Juan City Hospital [1-3]	San Juan, P. R.	G. Pico	221	6,211	2	4	2	225

14. ORTHOPEDIC SURGERY

Type of training acceptable to Board: A—Adult Orthopedics; C—Children's Orthopedics; F—Fractures.

Residency programs in the following hospitals have been approved by the Council and the American Board of Orthopedic Surgery, through the Residency Review Committee for Orthopedic Surgery, as offering acceptable training in adult orthopedics, children's orthopedics, and fractures. Training in the basic sciences is given either as an integral part of these services or as a separate course. Services collaborating in an integral plan of training are designated by a program number, a list of which is found on pages 594 through 596.

Residents completing their training in these hospitals are eligible for full certification by the American Board of Orthopedic Surgery, including children's orthopedic surgery.

Hospitals, 263; Assistant Residencies and Residencies, 1,124

Name of Hospital	Location	Chief of Service	Type of Training	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
UNITED STATES ARMY									
Fitzsimons Army Hospital [1-3]	Denver, Colo.	R. D. Anderson	AF	65	744	1	1	3	...
Army Medical Center [1-3]	Washington, D. C.	M. S. Thompson	ACF	......	997	6	4	12	...
Brooke Army Hospital [1-3]	San Antonio, Texas	H. S. McBurney	ACF	......	1,477	8	3	9	...
Tripler Army Hospital [1-3-101]	Honolulu, T. H.	E. C. Lineberger	ACF	......	2,437	1	2	8	...
UNITED STATES NAVY									
U. S. Naval Hospital [1-3]	Bethesda, Md.	T. M. Foley	AF	20	5,562	..	3	6	...
U. S. Naval Hospital [1-3]	Philadelphia	W. D. Bundens, Jr.	AF	62	916	..	3	5	...
UNITED STATES PUBLIC HEALTH SERVICE									
U. S. Public Health Service Hospital [1-3]	San Francisco	C. B. Vaughn, Jr.	AF	87	1,021	1	1	3	...
NONFEDERAL AND VETERANS ADMINISTRATION									
University [illegible] Medical Center [1-3]									
Crippled [illegible] man Clinic [1-3]	Birmingham, Ala.	J. D. Sherrill	C	44, 68	583	..	..	3	275
Universi[illegible] [3]	Birmingham, Ala.	J. D. Sherrill, Sr.	ACF	44	1,927	4	2	8	105
Veteran[illegible]	Birmingham, Ala.	M. A. Accinno	AF	44	239	1	..	2	...
Lloyd No[illegible]	Fairfield, Ala.	C. L. Yelton	AF	68	888	..	1	4	250
Mobile C[illegible] [1]	Mobile, Ala.	W. C. Hannon	ACF	......	439	1	1	4	275
Arkansas [illegible]	Little Rock, Ark.	J. D. Christian	O	1	298	..	..	2	...
Veterans [illegible]	Long Beach, Calif.	R. H. Hall	AF	64	384	1	1	3	...
Children's [illegible]	Los Angeles	S. S. Mathews	C	64	517	..	..	1	275
Los Angeles County Hospital [1-60]	Los Angeles	C. Mason	ACF	......	4,236	89	5	18	216
Orthopaedic Hospital [1-3]	Los Angeles	J. V. Luck	ACF	14, 79, 90	2,568	..	4	8	200
Shriners Hospital for Crippled Children [1-3]	Los Angeles	G. W. Westin	O	3, 90	353	..	2	2	200
University of California Hospital [1-3]	Los Angeles	C. O. Bechtol	ACF	90	429	4	1	3	229
Veterans Admin. Hospital [1-3]	Los Angeles	R. Mazet, Jr.	AF	90	1,139	12	3	7	...
[illegible] [1-3-67]	Oakland, Calif.	T. G. Reynolds	AF	14	543	..	1	3	215
[illegible] East Bay [1]	Oakland, Calif.	B. Smart	O	2	419	1	1	1	225
[illegible] Hospital [1-3]	Oakland, Calif.	D. Dickson	AF	3	833	8	2	3	200
Samuel Merritt Hos[illegible]	San Francisco	E. G. Ewer	AF	2	1,442	3	..	..	...
Children's Hospital [1-3]		L. J. Larsen	O	2	534	2	..	2	175

Numerical and other references will be found on pages 640 through 642.

14. ORTHOPEDIC SURGERY—Continued

Name of Hospital	Location	Chief of Service	Type of Training	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered [3]	Total Residencies Offered [4]	Beginning Stipend (Month)
Franklin Hospital [1]	San Francisco	F. C. Bost	A	2	1,087	4	..	..	...
St. Mary's Hospital [1-3]	San Francisco	J. J. Loutzenheiser	AF	79	997	2	1	3	200
San Francis	San Francisco	.....	.....	.....	.....	..	..	..	...
Stanford	.....	F. J. Cox	AF	3	555	..	1	2	205
University	.....	E. R. Schottstaedt	AF	2	548	..	..	1	205
Shriners Hospital for Crippled Children [1]	San Francisco	F. C. Bost	C	2	322	1	..	2	200
Stanford University Hospitals [1-3]	San Francisco	D. E. King	A	3	1,132	3	1	3	100
University of California Hospitals [3]	San Francisco	V. T. Inman	A	2	650	2	1	4	231
Veterans Admin. Hospital [1-3]	San Francisco	V. T. Inman-D. E. King	AF	2, 3	231	6	1	3	...
Harbor General Hospital [1]	Torrance, Calif.	W. G. Rhorer-S. Haft	AF	90	725	7	1	4	216
Children's Hospital [1-3]	Denver	I. E. Hendryson	C	4, 65	645	..	2	2	200
University of Colorado Medical Center									
Colorado General Hospital [1-3]	Denver	A. Thomas	AF	4	369	10	2	8	180
Denver General Hospital [1-3]	Denver	J. Miles	AF	4	624	7	..	..	179
Veterans Admin. Hospital [1-3]	Denver	M. E. Gibbens	AF	74	524	4	..	2	...
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	W. O. Southwick	AF	5	1,008	9	..	3	140
Hospital of St. Raphael	New Haven, Conn.	W. Perham	AF	43	534	9	2	6	150
Newington Home and Hospital for Crippled Children [1-3]	Newington, Conn.	B. H. Curtis	C	5, 82	504	..	..	5	200
Alfred I. Du Pont Institute of the Nemours Foundation [1]	Wilmington, Del.	A. R. Shands, Jr.	C	20, 62	236	..	2	2	150
District of Columbia General Hospital [1-3]	Washington, D. C.	M. Cobey-J. Adams	ACF	54	810	4	3	5	233
Washington Hospital Center [1-3]	Washington, D. C.	J. S. Neviaser	AF	54	1,461	4	1	3	215
Jackson Memorial Hospital [1-3]	Miami, Fla.	W. Miller	AF	76	1,862	12	2	6	75
Variety Children's Hospital [1-3]	Miami, Fla.	R. P. Keiser	C	76	470	..	..	..	...
Orange Memorial Hospital [1]	Orlando, Fla.	N. C. McCollough	ACF	......	1,308	1	1	3	325
American Legion Hospital for Crippled Children [1-3]	St. Petersburg, Fla.	C. L. Farrington	C	78	592	..	..	1	150
Tampa General Hospital [1]	Tampa, Fla.	F. Lindeman	ACF	78	1,048	4	1	3	250
Georgia Baptist Hospital [1]	Atlanta, Ga.	W. W. Lovell	AF	86	1,170	2	..	1	305
Grady Memorial Hospital [1]	Atlanta, Ga.	R. P. Kelly	ACF	39	802	3	2	6	100
Medical College of Georgia Hospitals									
Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga.	F. Bliven	AF	86	119	6	3	5	250
University Hospital [1]	Augusta, Ga.	J. L. Chandler	ACF	86	691	..	1	2	200
Emory University Hospital [1-3]	Emory University, Ga.	R. P. Kelly	A	39	674	1	..	3	255
Cook County Hospital	Chicago	F. Shapiro	ACF	......	762	..	2	5	140
Michael Reese Hospital [1-3]	Chicago	J. Finder	AC	42	1,215	4	1	2	125
Northwestern University Medical Center									
Chicago Wesley Memorial Hospital [1-3]	Chicago	E. L. Compere	ACF	7	1,699	2	2	4	125
Passavant Memorial Hospital [1-3]	Chicago	E. Hauser	A	7	795	..	2	2	125
Veterans Admin. Research Hospital [1-3]	Chicago	E. L. Compere	AF	7	313	1	..	1	...
Evanston Hospital [1-3]	Evanston, Ill.	V. C. Turner	AF	7	984	7	1	1	225
St. Elizabeth Hospital [3]	Chicago	C. Scuderi	F	42	1,158	2	1	1	200
Presbyterian-St. Luke's Hospital									
St. Luke's Hospital Division [1-3]	Chicago	C. N. Lambert	AF	47	370	1	1	2	125
Shriners Hospitals for Crippled Children [1-3]	Chicago	H. A. Sofield	C	50	288	..	3	3	...
University of Chicago Clinics [1-3]	Chicago	C. H. Hatcher	ACF	......	811	9	1	4	200
University of Illinois Research and Educational Hospitals [1-3]	Chicago	R. D. Ray	ACF	47	1,096	6	2	8	140
St. Francis Hospital [1]	Evanston, Ill.	J. J. Fahey	AF	7	1,102	1	2	3	210
Veterans Admin. Hospital [1-3-138]	Hines, Ill.	H. A. Sofield	AF	50	1,370	9	4	16	...
West Suburban Hospital [3]	Oak Park, Ill.	H. A. Sofield	AF	50	641	1	1	1	225
St. Francis Hospital	Peoria, Ill.	H. E. Cooper	ACF	......	2,019	1	1	3	225
Indianapolis General Hospital [1-3]	Indianapolis	H. Williams	AF	8	761	21	2	4	205
Indiana University Medical Center [1]	Indianapolis	G. J. Garceau	ACF	8	678	1	..	7	165
St. Vincent's Hospital [1-3]	Indianapolis	G. J. Garceau	AF	8	1,054	..	1	3	275
Veterans Admin. Hospital [1-3]	Indianapolis	G. J. Garceau	AF	8	415	..	1	2	...
Veterans Admin. Hospital [1-3]	Des Moines, Iowa	D. N. Gibson	AF	55	1,268	1	2	6	...
State University of Iowa Hospitals [1-3]	Iowa City	C. B. Larson	ACF	55	2,209	16	4	12	175
University of Kansas Medical Center	Kan.	L. Peltier	ACF	......	606	3	1	3	125
Veterans Admin. Hospital [1-3]	Kan.	R. L. Diveley	AF	18	134	8	1	4	...
St. Francis Hospital [1-3]	Wichita, Kan.	J. F. Lance	ACF	......	1,392	4	1	3	275
Good Samaritan Hospital [1-3]	Lexington, Ky.	K. Thompson	ACF	59	1,522	6	1	1	225
St. Joseph Hospital [3]	Lexington, Ky.	O. B. Murphy	ACF	59	688	7	1	3	230
Shriners Hospital for Crippled Children [1-3]	Lexington, Ky.	T. O. Yocum	C	9	179	..	..	2	200
Kosair Crippled Children Hospital	Louisville, Ky.	K. A. Fischer	C	9	600	..	4	4	200
Louisville General Hospital [1-3]	Louisville, Ky.	K. A. Fischer	AF	9	426	10	..	4	105
Veterans Admin. Hospital [1-3]	Louisville, Ky.	J. Lyford, III	AF	9	582	6	..	2	...
Charity Hospital of Louisiana									
Independent Unit [1]	New Orleans	L. K. Loomis	ACF	......	.....	..	1	4	100
Louisiana State University Unit [1]	New Orleans	H. T. Simon	ACF	......	1,040	12	3	12	100
Tulane University Unit [1]	New Orleans	J. Wickstrom	ACF	10	1,465	15	3	12	100
Ochsner Foundation Hospital [1-3-153]	New Orleans	H. D. Morris	AF	56	420	2	1	4	225
Touro Infirmary [1]	New Orleans	G. Berkett	ACF	10, 56	1,226	..	..	3	125
Veterans Admin. Hospital [1-3]	New Orleans	R. H. Alldredge	AF	10	342	2	1	4	...
Confederate Memorial Medical Center [1]	Shreveport, La.	C. R. Reed	ACF	70	1,267	7	2	8	125
Shriners Hospital for Crippled Children [1]	Shreveport, La.	G. D. Caldwell	C	70	216	..	..	1	200
Baltimore City Hospitals [1-3]	Baltimore	M. M. Ravitch	AF	57	486	8	..	1	150
Children's Hospital [1-3]	Baltimore	G. O. Eaton	C	57	501	..	..	..	...
James Lawrence Kernan Hospital for Crippled Children [1-3]	Baltimore	A. F. Voshell	C	88	545	..	..	2	250
Johns Hopkins Hospital [1-3]	Baltimore	R. A. Robinson	AF	57	906	6	..	9	160
University Hospital [1]	Baltimore	A. F. Voshell	AF	88	289	..	1	2	75
Boston City Hospital [1-3]	Boston	A. P. Aitken	AF	13, 66	2,015	14	..	9	152
Children's Medical Center	Boston	W. T. Green	C	11	1,070	1	7	13	...
Lahey Clinic [1-3]	Boston	G. E. Haggart	A	66	1,512	..	4	12	200
Massachusetts General Hospital [1-3-172]	Boston	J. S. Barr	ACF	11	2,028	..	4	7	67
Peter Bent Brigham Hospital [1-3]	Boston	W. T. Green	AF	11	Incl. in Surgery		..	1	62
Veterans Admin. Hospital [1-3]	Boston (Jamaica Plain)	A. Thibodeau	AF	13	845	3	2	6	...
Massachusetts Hospital School [1]	Canton, Mass.	P. L. Norton	C	13, 66	170	..	..	2	...
Lakeville State Sanatorium [3]	Middleboro, Mass.	P. Norton	C	13, 66	450	2	..	2	527
Shriners Hospital for Crippled Children [3]	Springfield, Mass.	G. Hough, Jr.	C	66	287	..	..	..	150
University Hospital [1-3-191]	Ann Arbor, Mich.	C. E. Badgley	ACF	......	1,536	13	6	18	195

Numerical and other references will be found on pages 640 through 642.

14. ORTHOPEDIC SURGERY—Continued

Name of Hospital	Location	Chief of Service	Type of Training	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered	Total Residencies Offered	Beginning Stipend (Month)
Children's Hospital	Detroit	F. J. Fischer	C	12	324	..	..	4	200
Harper Hospital[1-3]	Detroit	F. J. Fischer	A	12	963	5	2	2	300
Henry Ford Hospital[1-3]	Detroit	C. L. Mitchell	ACF	......	1,210	9	4	12	250
Receiving Hospital[1-3]	Detroit	A. Goetz	F	12	699	6	..	2	325
Blodgett Memorial Hospital[1-3]	Grand Rapids, Mich.	C. F. Frantz	ACF	......	460	1	1	3	300
St. Mary's Hospital[1-3]	Grand Rapids, Mich.	G. T. Aitken	ACF	......	484	3	1	3	275
Borgess Hospital[1]	Kalamazoo, Mich.	R. G. Howard	ACF	......	911	4	1	4	275
Minneapolis General Hospital	Minneapolis	M. J. Nydahl	AF	89	192	..	..	1	220
Shriners Hospital for Crippled Children[1-3]	Minneapolis	D. R. Lannin	C	16	309	..	..	2	...
University of Minnesota Hospitals[1-3-209]	Minneapolis	J. H. Moe	ACF	89	308	4	..	5	269
Veterans Admin. Hospital[1-3]	Minneapolis	E. T. Evans	AF	16	588	3	4	9	...
Mayo Foundation	Rochester, Minn.	H. H. Young	ACF	......	5,063	31	4	32	175
Gillette State Hospital for Crippled Children[1-3]	St. Paul	W. Cole	C	16, 89	......	..	..	..	233
Mississippi Baptist Hospital[1-3]	Jackson, Miss.	G. D. Purvis	ACF	73	1,320	3	..	2	250
University Hospital[1]	Jackson, Miss.	W. F. Enneking	AF	73	548	2	1	4	250
Veterans Admin. Hospital[1-3]	Jackson, Miss.	T. S. Robertson	AF	73	718	2	..	..	...
Children's Mercy Hospital[1-3]	Kansas City, Mo.	R. McCanse	C	18	186	..	..	..	175
Kansas City General Hospital No. 1[1-3]	Kansas City, Mo.	F. G. Pipkin	AF	18	820	21	..	..	200
St. Luke's Hospital[1-3]	Kansas City, Mo.	R. L. Diveley	ACF	18	560	6	1	3	310
Veterans Admin. Hospital[1-3]	Kansas City, Mo.	R. L. Diveley	AF	18	295	1	..	..	...
Barnes Hospital[1-3]	St. Louis	F. Reynolds	ACF	60	1,380	2	4	11	75
St. Louis City Hospital[1-3]	St. Louis	J. O. Lottes-R. E. Lord	F	46, 60	869	..	..	1	234
St. Mary's Group of Hospitals[1-3]	St. Louis	R. M. O'Brien	ACF	46	840	4	2	6	100
Shriners Hospital for Crippled Children[1]	St. Louis	G. E. Scheer	C	60	544	..	..	3	...
Nebraska Orthopedic Hospital[1]	Lincoln, Neb.	F. Teal	C	33	581	3	1	1	150
Veterans Admin. Hospital[1-3]	Lincoln, Neb.	J. E. M. Thomson	AF	33	625	1	1	1	...
Darthmouth Medical School Affiliated Hospitals		O. S. Staples	.....	......	1,032	3	1	3	218
Mary Hitchcock Memorial Hospital[1-3]	Hanover, N. H.		AF	82	......	..	..	..	...
Veterans Admin. Hospital[1-3]	White River Jct., Vt.		F	82	......	..	..	..	...
Monmouth Memorial Hospital[1-3]	Long Branch, N. J.	B. Hallbstein	ACF	......	937	4	1	3	200
United Hospitals of Newark									
Hospital for Crippled Children[1-3]	Newark N. J.	H. Kessler-D. Eisenberg	AC	67	2,002	2	..	3	150
Hospital Center at Orange		H. T. Hansen	ACF	......	1,179	3	3	3	150
New Jersey Orthopaedic Hospital[1-3]	Orange, N. J.		.....	......	......	..	..	..	...
Orange Memorial Hospital[1-3]	Orange, N. J.		.....	......	......	..	..	..	...
St. Joseph Hospital[1-3]	Paterson, N. J.	R. R. Goldenberg	ACF	......	758	4	1	1	200
Carrie Tingley Hospital for Crippled Children[1-3]	Truth Or Consequences, N. Mex.	M. Dobelle	C	4, 74	466	1	1	4	225
Albany Hospital[1-3]	Albany, N. Y.	C. Campbell	AF	45	820	7	1	4	160
House of St. Giles the Cripple[1-3]	Brooklyn, N. Y.	M. Cleveland	C	26, 41	140	..	..	2	100
Jewish Chronic Disease Hospital[1-3]	Brooklyn, N. Y.	M. Schneider	C	84	178	3	..	1	175
Jewish Hospital[1-3]	Brooklyn, N. Y.	A. Kennin	AF	84	551	..	1	3	100
Kings County Hospital									
Division I[1-3]	Brooklyn, N. Y.	C. C. Vitale	ACF	......	242	..	1	3	105
Division II[1-3]	Brooklyn, N. Y.	R. F. Warren	ACF	......	734	5	1	3	105
St. Charles Hospital[1-3]	Brooklyn, N. Y.	H. C. Vett	C	52	301	..	4	4	125
Veterans Admin. Hospital[1-3-262]	Brooklyn, N. Y.	S. E. Chessid	AF	52	330	1	1	3	...
Buffalo General Hospital[1-3]	Buffalo	B. E. Obletz	AF	24	977	8	2	8	175
Children's Hospital[1-3]	Buffalo	J. D. Godfrey	C	24	510	..	..	4	125
Edward J. Meyer Memorial Hospital[1-3]	Buffalo	J. P. Cole	AF	83	297	9	1	3	247
Veterans Admin. Hospital[1-3]	Buffalo	W. M. Chardack	AF	24	976	2	1	4	...
Meadowbrook Hospital[1-3]	Hempstead, N. Y.	O. C. Hudson	F	38	2,073	14	4	4	225
Nassau Hospital[3]	Mineola, N. Y.	C. F. Freese	AF	38	1,536	3	1	3	325
Bellevue Hospital Center Div. IV—New York University Post-Graduate Medical School[273]	New York City	W. A. L. Thompson	ACF	51	1,143	..	4	12	71
Bronx Municipal Hospital Center[1-3]	New York City	A. Schildhaus	ACF	......	323	6	2	6	125
Hospital for Joint Diseases[1-3]	New York City	J. E. Milgram	ACF	......	3,260	8	6	18	80
Hospital for Special Surgery[1-3]	New York City	T. C. Thompson	ACF	22	2,016	15	4	12	160
Metropolitan Hospital[1-3]	New York City	M. J. Wilson	AF	67	489	2	2	4	105
Mount Sinai Hospital[1-3]	New York City	R. K. Lippmann	ACF	......	437	2	2	4	75
New York Polyclinic Medical School and Hospital[1]	New York City	D. M. Bosworth	F	26	408	2	..	1	125
Presbyterian Hospital[1]	New York City	F. E. Stinchfield	ACF	......	3,025	3	6	24	206
St. Luke's Hospital[1-3]	New York City	D. M. Bosworth	ACF	11	728	3	1	3	100
Veterans Admin. Hospital (Bronx)[1-3-267]	New York City	T. C. Thompson	AF	22	692	2	2	4	...
Veterans Admin. Hospital (Manhattan)[1-3-265]	New York City	G. Truchly	AF	80	637	3	2	6	...
St. Charles Hospital[1-3]	Port Jefferson, N. Y.	F. S. Child	C	3,843	303	..	3	3	150
Rochester General Hospital[1-3]	Rochester, N. Y.	M. L. Rowe, Jr.	A	31	672	6	..	..	125
Strong Memorial—Rochester Municipal Hospital[1-3]	Rochester, N. Y.	F. N. Zuck	ACF	81	1,098	..	3	7	117
Ellis Hospital[1-3]	Schenectady, N. Y.	W. E. Gazeley	ACF	..	1,527	2	1	2	150
St. Vincent's Hospital[1-3]	Staten Island, N. Y.	D. M. Bosworth	F	26	577	..	1	1	240
Sea View Hospital[1-3]	Staten Island, N. Y.	D. M. Bosworth	A	26	220	1	4	4	157
State University of New York Upstate Medical Center[1-3]	Syracuse, N. Y.	R. C. Lockwood	.....	48	1,837	7	..	3	233
Hospital of the Good Shepherd			CF	48	......	..	..	..	...
Syracuse Memorial Hospital			C	48	......	..	..	..	...
Veterans Admin. Hospital			A	48	......	..	..	..	...
New York State Rehabilitation Hospital[1-3]	West Haverstraw, N. Y.	J. C. McCauley	C	51, 80	566	2	4	4	272
North Carolina Memorial Hospital[1-3]	Chapel Hill, N. C.	R. B. Raney	AF	81	450	1	1	2	175
Duke University Affiliated Hospitals									
Duke Hospital[1-3-300]	Durham, N. C.	L. D. Baker	ACF	19	825	3	6	19	127
Veterans Admin. Hospital[1-3]	Durham, N. C.	F. W. Clippinger	AF	19	433	3	..	2	...
North Carolina Orthopedic Hospital	Gastonia, N. C.	W. M. Roberts	C	19, 81	235	1	4	4	150
North Carolina Baptist Hospital[1-3-305]	Winston-Salem, N. C.	H. F. Forsyth	AF	77	862	3	3	6	100
Akron City Hospital[1-3]	Akron, Ohio	A. E. Davis	AF	15	1,602	11	2	6	250
Akron General Hospital[1]	Akron, Ohio	D. I. Minnig	AF	58	1,300	4	..	3	275
Mary Day Nursery and Children's Hospital[1]	Akron, Ohio	F. B. Roberts	C	15, 58	597	..	2	6	250
University of Cincinnati College of Medicine Hospital Group									
Cincinnati General Hospital[1-3-308]	Cincinnati	J. Freiberg	AF	17	219	4	2	6	75
Children's Hospital[1]	Cincinnati	J. A. Freiberg	C	17	389	..	..	..	...

Numerical and other references will be found on pages 640 through 642.

14. ORTHOPEDIC SURGERY—Continued

Name of Hospital	Location	Chief of Service	Type of Training	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[8]	Beginning Stipend (Month)
Jewish Hospital [1-3]	Cincinnati	R. Perlman	A	17	787	7	..	1	215
Cleveland Clinic Hospital [1-3]	Cleveland	J. I. Kendrick	ACF	......	913	17	2	6	175
St. Luke's Hospital [1-3]	Cleveland	W. H. McGaw	ACF	......	1,128	1	1	4	140
University Hospitals [1-3]	Cleveland	C. H. Herndon	ACF	27	1,371	1	..	9	183
Veterans Admin. Hospital [1-3]	Cleveland	C. H. Herndon	A	27	366	2	1	4	...
Children's Hospital [1]	Columbus, Ohio	H. B. Lacey	C	25	509	..	..	4	225
Mount Carmel Hospital [1-3]	Columbus, Ohio	H. B. Lacey	AF	25	1,374	7	1	2	275
Ohio State University Hospitals									
University Hospital [1-3]	Columbus, Ohio	W. S. Smith	AF	25	532	7	..	5	202
White Cross Hospital [1-3]	Columbus, Ohio	J. D. Wilson	AF	25	1,022	1	1	2	290
Elyria Memorial Hospital [1-3]	Elyria, Ohio	C. H. Heyman	C	27	391	..	..	2	270
St. Vincent's Hospital [1-3]	Toledo, Ohio	A. L. Bershon	ACF	......	1,266	2	1	3	325
Youngstown Hospital [1-3]	Youngstown, Ohio	W. D. McElroy	AF	71	1,410	8	1	3	325
Bone and Joint Hospital [3]	Oklahoma City	E. Margo	AF	53	2,115	6	2	5	300
St. Anthony Hospital	Oklahoma City	W. K. West	A	53	1,857	1	1	1	300
University of Oklahoma Hospitals [1-3,324]	Oklahoma City	D. H. O'Donoghue	ACF	53	1,242	..	3	12	200
Veterans Admin. Hospital [3]	Oklahoma City	W. K. West	AF	53	815	2	..	1	...
Emanuel Hospital [1-3]	Portland, Ore.	J. A. Mason	AF	28	2,280	7	..	2	275
Shriners Hospital for Chrippled Children [1-3]	Portland, Ore.	L. S Lucas	C	28	356	..	..	2	150
University of Oregon Medical									
School Hospitals and Clinics [1-3]	Portland, Ore.	W. E. Snell	AF	28	1,093	..	2	8	125
Veterans Admin. Hospital [1-3]	Portland, Ore.	R. C. Merrifield	AF	91	704	2	2	4	...
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	L. F. Bush	AF	6	763	3	1	3	175
State Hospital For Crippled Children [1]	Elizabethtown, Pa.	T. Outland	C	21, 92	361	..	..	..	...
Hamot Hospital [1-3]	Erie, Pa.	C. W. Fortune	ACF	......	2,038	8	1	4	250
Albert Einstein Medical Center [1-3]	Philadelphia	A. M. Rechtman	ACF	......	854	1	2	7	125
Children's Hospital [1-3]	Philadelphia	J. T Nicholson	C	23, 72	243	..	..	2	75
Graduate Hospital of the									
University of Pennsylvania [1-3]	Philadelphia	J. Nicholson	A	23	302	..	1	1	100
Hahnemann Medical College and Hospital [1-3]	Philadelphia	E. O. Geckeler	AF	92	863	6	2	4	75
Hospital of the University of Pennsylvania [1-3]	Philadelphia	P Colonna	ACF	......	992	2	2	7	...
Jefferson Medical College Hospital [1-3]	Philadelphia	A. F. De Palma	ACF	21	1,016	1	2	8	100
Pennsylvania Hospital [1-3]	Philadelphia	J. T. Nicholson	F	23	257	3	..	..	20
Philadelphia General Hospital [1-3]	Philadelphia	I. Stein	ACF	......	1,009	51	2	7	121
Shriners Hospital For Crippled Children [1-3]	Philadelphia	J. R. Moore	C	29	283	..	1	4	75
Temple University Hospital [1-3]	Philadelphia	J. R. Moore	AF	29	1,189	14	4	12	...
Allegheny General Hospital [1]	Pittsburgh	P. B. Steele- J. A. Heberling	ACF	69, 71, 83	1,577	10	1	4	200
Health Center Hospitals of the University of Pittsburgh School of Medicine									
Children's Hospital [1-3]	Pittsburgh	A. B. Ferguson	C	6, 30, 45	821	1	..	5	150
Presbyterian Hospital [1-3]	Pittsburgh	A. Ferguson	AF	30	3,033	..	5	12	125
Veterans Admin. Hospital [1-3]	Pittsburgh	P. G. Laing	AF	30	1,603	8	..	3	...
St. Francis General Hospital									
and Rehabilitation Institute [1-3]	Pittsburgh	M. S. De Roy	A	69	1,165	..	..	1	225
Reading Hospital [1-3,244]	Reading, Pa.	E. J. Morrissey	AF	72	764	12	1	4	225
Robert Packer Hospital [1-3]	Sayre, Pa.	D. R. Baker	ACF	......	952	5	1	3	225
Rhode Island Hospital [1-3]	Providence, R. I.	K. G. Burton	ACF	......	1,822	5	1	4	125
Teaching Hospitals of the Medical College									
of South Carolina	Charleston, S. C.	J. Siegling	ACF	......	573	1	1	3	137
Medical College Hospital		....	....	......	....	..	..	..	...
Roper Hospital		....	....	......	....	..	..	..	...
Columbia Hospital of Richland County [1]	Columbia, S. C.	W. A. Boyd	ACF	......	1,692	5	1	3	175
Greenville General Hospital [1]	Greenville, S. C.	L. C. Meyer	AF	19	1,190	4	..	3	275
Shriners Hospital For Crippled Children [1-3]	Greenville, S. C.	F. H. Stelling	C	19, 77	303	..	..	2	150
Baroness Erlanger Hospital [1-3]	Chattanooga, Tenn.	J J. Killeffer	ACF	......	2,102	10	1	3	275
East Tennessee Baptist Hospital [1-3]	Knoxville, Tenn.	G. A. L. Inge	AF	85	1,012	3	2	6	150
East Tennessee Crippled Children's Hospital	Knoxville, Tenn.	S. Carlson	C	85	449	..	2	2	150
St. Mary's Memorial Hospital [1-3]	Knoxville, Tenn.	R. Brashear	AF	85	1,456	..	..	1	250
University of Tennessee Memorial Research									
Center and Hospital [1-3]	Knoxville, Tenn.	G. L. Inge	AF	85	528	6	2	6	320
Campbell Clinic Hospital [3]	Memphis, Tenn.	J. S. Speed	ACF	......	2,404	2	4	12	50
Veterans Admin. Hospital [1-3]	Memphis, Tenn.	D. M. Street	AF	1	1,177	4	1	9	...
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	J W. Hillman	ACF	......	973	..	1	3	50
Baylor University Hospital [1-3]	Dallas, Texas	M. P. Knight	A	32	2,714	1	1	3	175
Parkland Memorial Hospital [1-3]	Dallas, Texas	C. F. Gregory	F	32	930	5	..	3	150
Texas Scottish Rite Hospital									
For Crippled Children [1-3]	Dallas, Texas	B. Carrell	C	32, 75	562	..	1	3	125
Veterans Admin. Hospital [1-3]	Dallas, Texas	V. M. Bryant	AF	75	1,193	4	2	7	...
University of Texas Medical									
Branch Hospitals [1-3]	Galveston, Texas	G. W. N. Eggers, Sr.	ACF	......	753	4	2	4	160
Baylor University College of Medicine Affiliated Hospitals									
Jefferson Davis Hospital [1-3]	Houston, Texas	F. A. Bloom	ACF	49	788	10	..	4	75
Veterans Admin. Hospital [1-3]	Houston, Texas	E. M Cowart	AF	49	1,113	..	..	4	...
Hermann Hospital [1-3]	Houston, Texas	E. T. Smith	ACF	......	2,043	6	1	5	125
Scott and White Memorial Hospitals [1-3]	Temple, Texas	R. A. Murray	ACF	......	2,198	..	1	3	300
Dr. W. H Groves Latter-Day Saints Hospital [1-3]	Salt Lake City	P Milligan	AF	63	996	2	..	3	275
Primary Children's Hospital [1-3]	Salt Lake City	S. W. Allred	C	7, 63	212	..	..	2	200
Salt Lake County General Hospital [3]	Salt Lake City	S. Coleman	F	34	154	1	1	1	220
Shriners Hospital For Crippled Children [1-3]	Salt Lake City	S. S. Coleman	C	34, 87	267	..	..	2	200
Veterans Admin. Hospital [1-3]	Salt Lake City	S. S. Coleman	A	34	361	1	..	1	...
University of Virginia Hospital [1-3]	Charlottesville, Va.	J. H. Allan	ACF	......	812	3	2	6	50
Crippled Children's Hospital [1-3]	Richmond, Va.	J. T. Tucker	C	35	399	..	..	2	200
Medical College of Virginia—Hospital Division [1-3]	Richmond, Va.	M. J. Hoover	AF	35	1,398	9	3	9	75
Veterans Admin. Hospital [1-3]	Richmond, Va.	R. D. Butterworth	AF	35	874	2	1	4	...
Children's Orthopedic Hospital [1-3]	Seattle	J. Le Coco	C	36, 91	826	..	..	..	160
King County Hospital Unit No. 1 (Harborview) [1]	Seattle	J. F. Le Coco	AF	36	739	30	..	2	165
Providence Hospital [1-3]	Seattle	E. A. Rogge	A	36	1,780	..	1	1	215
Veterans Admin. Hospital [1-3]	Seattle	E. M. Borgess	A	36	190	2	1	1	...
University Hospitals [1-3]	Madison, Wis.	R. Burns	ACF	......	1,167	6	2	7	100
Columbia Hospital [1-3,76]	Milwaukee	A. C. Schmidt	AF	37	758	8	2	8	245
Milwaukee Children's Hospital [1-3]	Milwaukee	W. P. Blount	C	37, 40	482	..	..	..	...
Veterans Admin. Hospital [1-3]	Milwaukee (Wood), Wis.	P. L. Carnesale	AF	40	1,178	11	2	5	...
Shriners Hospitals For Crippled Children [1]	Honolulu, T. H.	I. J. Larsen	C	50	172	1	1	1	100

Numerical and other references will be found on pages 640 through 642.

14. ORTHOPEDIC SURGERY—Continued

Residency programs in the following hospitals have been approved by the Council and the American Board of Orthopedic Surgery, through the Residency Review Committee for Orthopedic Surgery, as offering acceptable training in adult orthopedics and fractures. Training in the basic sciences is given as an integral part of these services or as a separate course. Services collaborating in an integral plan of training are designated by a program number, a list of which is found on pages 594 through 596.

Residents completing three years of training in Adult Orthopedics and Fractures at these hospitals are eligible for limited certification by the American Board of Orthopedic Surgery, not to include children's orthopedic surgery.

Hospitals, 16; Assistant Residencies and Residencies, 56

Name of Hospital	Location	Chief of Service	Type of Training	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered*	Total Residencies Offered*	Beginning Stipend (Month)
UNITED STATES AIR FORCE									
U. S. Air Force Hospital	San Antonio, Texas	E. W. Brannon	AF	......	1,850	..	..	6	...
UNITED STATES ARMY									
Letterman Army Hospital [1-3]	San Francisco	L. W. *Taylor*	AF	......	1,508	4	3	9	...
UNITED STATES NAVY									
U. S. Naval Hospital [1-3]	Oakland, Calif.	H. A. Streit	AF	......	1,615	1	3	6	...
U. S. Naval Hospital [1-3]	Chelsea, Mass.	W. S. Stryker	AF	......	903	..	2	5	...
U. S. Naval Hospital [1-3]	Portsmouth, Va.	C. A. Stevenson	AF	......	2,335	1	2	4	...
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE									
Freedmen's Hospital [1-3]	Washington, D. C.	J. R. Gladden	AF	......	461	2	1	1	308
NONFEDERAL AND VETERANS ADMINISTRATION									
San Diego County General Hospital [1-3]	San Diego, Calif.	R. M. Kimball	AF	......	328	..	1	3	250
St. Joseph's Hospital [1-3]	San Francisco	R. Soto Hall	AF	......	863	4	1	3	300
Methodist Hospital [1]	Indianapolis	W. Norman	AF	......	1,845	13	1	2	278
Mercy Hospital [1-2]	Iowa City	A. Steindler	AF	......	816	..	2	2	100
Worcester City Hospital [1-3]	*Worcester*, Mass.	W. Eddy	AF	......	828	10	1	2	215
Veterans Admin. Hospital [1-3]	St. Louis	O. P. Hampton, Jr.	AF	......	419	3	1	3	...
Queens Hospital Center [1-3]	Jamaica, N. Y.	A. H. Lewert	AF	......	298	5	1	3	105
Charlotte Memorial Hospital [1]	*Charlotte*, N. C.	C. R. Carr	AF	......	1,585	7	1	3	250
Mount Sinai Hospital [1-3]	Cleveland	A. Miller	AF	......	988	4	1	2	215
Veterans Admin. Hospital [1-3-5a]	*Philadelphia*	J. A. Deakins	AF	......	382	2	..	2	...

Residency programs in the following hospitals have been approved by the Council and the American Board of Orthopedic Surgery, through the Residency Review Committee for Orthopedic Surgery, as offering acceptable training in [illegible] surgery as an independent program. Some of these services also participate in an integrated program offering full training in all categories of Orthopedic Surgery and are also listed on pages 590 through 594.

Hospitals, 11; Assistant Residencies and Residencies; 19.

Name of Hospital	Location	Chief of Service	Type of Training	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered*	Total Residencies Offered*	Beginning Stipend (Month)
NONFEDERAL									
Children's Hospital [1]	Los Angeles	S. S. Mathews	C	......	517	..	..	1	275
Shriners Hospital For Crippled Children [1-3]	Los Angeles	G. W. Westin	C	......	353	..	2	2	200
Children's Hospital of the East Bay	Oakland, Calif.	B. Smart	C	......	419	1	1	1	225
Newington Home and Hospital For Crippled Children [1-3]	Newington, Conn.	B. H. Curtis	C	......	504	..	..	5	200
Hope Haven Hospital [3]	Jacksonville, Fla.	F. L. Fort	C	......	303	..	..	1	225
American Legion Hospital for Crippled Children [1-3]	St. Petersburg, Fla.	C. L. Farrington	C	......	592	..	..	1	150
Scottish Rite Hospital for Crippled Children	Decatur, Ga.	J. H. Kite	C	......	285	..	1	1	200
Children's Memorial Hospital [1-4]	Chicago	C. N. Pease	C	......	584	1	..	1	125
Shriners Hospital for Crippled Children [1-3]	Lexington, Ky.	T. D. Yocum	C	......	179	..	..	2	175
Primary Children's Hospital [1-3]	Salt Lake City	S. W. Allred	C	......	212	..	..	2	200
Shriners Hospital for Crippled Children [1]	Spokane, Wash.	N. R. Brown	C	......	302	1	..	2	...

ORTHOPEDIC SURGERY—PROGRAM IDENTIFICATION

Program Number	Hospital	Location
1.	Arkansas Children's Home and Hospital	Little Rock, Ark.
	Veterans Admin. Hospital	Memphis, Tenn.
2.	Children's Hospital of the East Bay	Oakland, Calif.
	Samuel Merritt Hospital	Oakland, Calif.
	Veterans Admin. Hospital	San Francisco
	Children's Hospital	San Francisco
	Franklin Hospital	San Francisco
	San Francisco Hospital	San Francisco
	Shriners Hospital for Crippled Children	San Francisco
	University of California Hospital	San Francisco
3.	Shriners Hospital for Crippled Children	Los Angeles
	Highland-Alameda County Hospital	Oakland, Calif.
	Veterans Admin. Hospital	San Francisco
	San Francisco Hospital	San Francisco
	Stanford University Hospital	San Francisco
4.	Children's Hospital	Denver
	Colorado General Hospital	Denver
	Denver General Hospital	Denver
	Carrie Tingley Hospital for Crippled Children	Truth or Consequences, N. Mexico
5.	Grace-New *Haven Community* Hospital	New Haven, Conn.
	N[illegible] Home and Hospital	
	[illegible]	Newington, Conn.
6.	G[illegible] orial Hospital	Danville, Pa.
	[illegible]	Pittsburgh
		Chicago
7.	Chicago Wesley Memorial Hospital	Chicago
	Passavant *Memorial Hospital*	Chicago
	Veterans Admin. Research Hospital	Evanston, Ill.
	Evanston [illegible]	Evanston, Ill
	St. Franc[illegible]	Salt Lake City
	Primary [illegible]	Indianapolis
8.	Veterans [illegible]	Indianapolis
	Indianapolis General Hospital	Indianapolis
	Indiana University Medical Center	Indianapolis
	St. Vincent's [illegible]	Lexington, Ky.
9.	Shriners Hosp[illegible]	Louisville, Ky.
	Veterans Adm[illegible]	Louisville, Ky.
	Kosair Crippl[illegible]	Louisville, Ky.
	Louisville Gen[illegible]	New Orleans
10.	Veterans Admin. Hospital	
	Charity Hospital of *Louisiana*	New Orleans
	Tulane University Unit	New Orleans
	Touro Infirmary	Boston
11.	Children's Medical Center	Boston
	Massachusetts General Hospital	Boston
	Peter Bent Brigham Hospital	Detroit
12.	Children's Hospital	Detroit
	Harper Hospital	Detroit
	Receiving Hospital	

Numerical and other references will be found on pages 640 through 642.

14. ORTHOPEDIC SURGERY—Continued

ORTHOPEDIC SURGERY—PROGRAM IDENTIFICATION

Program Number	Hospital	Location
13.	Veterans Admin. Hospital	Boston
	Boston City [illegible]	Boston
	Massachusett[illegible]	Mass.
	Lakeville Sta[illegible]	Mass.
14.	Orthop[illegible]	Los Angeles
	White [illegible]	Los Angeles
15.	Mary I[illegible]	Akron, Ohio
	Akron City Hospital	Akron, Ohio
16.	Veterans Admin. [illegible]	Minneapolis
	Shriners Hospital [illegible]	Minneapolis
	Gillette State Hos[illegible]	St. Paul
17.	Children's Hospital	Cincinnati
	Cincinnati General Hospital	Cincinnati
	Jewish [illegible]	Cincinnati
18.	Veterans [illegible]	[illegible] Kansas
	Children [illegible]	[illegible]ity, Mo.
	Kansas [illegible]	[illegible]ity, Mo.
	St. Luke's Hospital	Kansas City, Mo.
	Veterans Admin. Hospital	Kansas City, Mo.
19.	[illegible]	Durham, N. C.
	[illegible]	Durham, N. C.
	[illegible]	Gastonia, N.C.
	[illegible]	Greenville, S. C.
	[illegible]	Greenville, S. C.
20.	Alfred I. du Pont Institute of the Nemours Foundation	Wilmington, Del.
	U. S. Naval [illegible]	Bethesda, Md.
21.	State Hospi[illegible]	[illegible]
	Jefferson M[illegible]	[illegible]
22.	Veterans Admin. Hospital (Bronx)	New York City
	Hospital for Special Surgery	New York City
23.	Children's Hospital	Philadelphia
	Graduate Hospital of the University of Pennsylvania	Philadelphia
	Pennsylvania Hospital	Philadelphia
24.	Veterans Admin. Hospital	Buffalo
	Buffalo General Hospital	Buffalo
	Children's [illegible]	Buffalo
25.	Children's [illegible]	[illegible] Ohio
	Mount Carr[illegible]	[illegible] Ohio
	Ohio State University Hospitals University Hospital	Columbus, Ohio
	White Cross Hospital	Columbus, Ohio
26.	House of St. Giles the Cripple	Brooklyn
	New York Polyclinic Medical School and Hospital	New York City
	St. Vincent's Hospital	Staten Island, N. Y.
	Seaview Hospital	Staten Island, N. Y.
27.	University Hospital	Cleveland
	Veterans Admin. Hospital	Cleveland
	Elyria Memorial Hospital	Elyria, Ohio
28.	Emanuel Hospital	Portland, Oregon
	Shriners Hospital for Crippled Children	Portland, Oregon
	University of Oregon Medical School Hospital and Clinics	Portland, Oregon
29.	Shriners Hospital for Crippled Children	Philadelphia
	Temple University Hospital	Philadelphia
30.	Children's Hospital	Pittsburgh
	Presbyterian Hospital	Pittsburgh
	Veterans Admin. Hospital	Pittsburgh
31.	Rochester General Hospital	Rochester, N. Y.
	Strong Memorial-Rochester Municipal Hospitals	Rochester, N. Y.
32.	Baylor University Hospital	Dallas, Texas
	Parkland Hospital	Dallas, Texas
	Texas Scottish Rite Hospital for Crippled Children	Dallas, Texas
33.	Nebraska Orthopedic Hospital	Lincoln, Nebr.
	Veterans Admin. Hospital	Lincoln, Nebr.
34.	Veterans Admin. Hospital	Salt Lake City
	Salt Lake County General Hospital	Salt Lake City
	Shriners Hospital for Crippled Children	Salt Lake City
35.	Veterans Admin. Hospital	Richmond, Va.
	Crippled Children's Hospital	Richmond, Va.
	Medical College of Virginia-Hospital Div	Richmond, Va.
36.	Veterans Admin. Hospital	Seattle
	Children's Orthopedic Hospital	Seattle
	King County Hospital, Unit 1 (Harborview)	Seattle
	Providence Hospital	Seattle
37.	Columbia Hospital	Milwaukee
	Milwaukee Children's Hospital	Milwaukee
38.	Meadowbrook Hospital	Hemstead, N. Y.
	Nassau Hospital	Mineola, N. Y.
	St. Charles Hospital	Port Jefferson, N. Y.
39.	Grady Memorial Hospital	Atlanta, Ga.
	Emory University Hospital	Emory University, Ga.
40.	Veterans Admin. Hospital	Milwaukee
	Milwaukee Children's Hospital	Milwaukee
41.	House of St. Giles the Cripple	Brooklyn
	St. Luke's Hospital	New York City
42.	Michael Reese Hospital	Chicago
	St. Elizabeth's Hospital	Chicago
43.	Hospital of St. Raphael	New Haven, Conn.
	St. Charles Hospital	Port Jefferson, N. Y.
44.	Veterans Admin. Hospital	Birmingham, Ala.
	Crippled Children's Hospital	Birmingham, Ala.
	University Hospital and Hillman Clinic	Birmingham, Ala.
45.	Albany Hospital	Albany, N. Y.
	Children's Hospital	Pittsburgh
46.	St. Louis City Hospital	St. Louis
	St. Mary's Group of Hospitals	St. Louis
47.	St. Luke's Hospital	Chicago
	University of Illinois Research and Educational Hospital	Chicago
48.	Hospital of the Good Shepherd	Syracuse, N. Y.
	State Univ. of New York Upstate Medical Center	Syracuse, N. Y.
	Syracuse Memorial Hospital	Syracuse, N. Y.
	Veterans Admin. Hospital	Syracuse, N. Y.
49.	Veterans Admin. Hospital	Houston, Texas
	Jefferson Davis Hospital	Houston, Texas
50.	Veterans Admin. Hospital	Hines, Illinois
	Shriners Hospital for Crippled Children	Chicago
	Shriners Hospital for Crippled Children	Honolulu, T. H.
	West Suburban Hospital	Oak Park, Ill.
51.	Bellevue Hospital Center, Division IV-New York University Postgraduate Med. School	New York City
	Rehabilitation Hospital	West Haverstraw, N. Y.
52.	Veterans [illegible]	Brooklyn
	St. Charl[illegible]	Brooklyn
53.	Veterans [illegible]	[illegible]homa City
	Bone and Joint Hospital	Oklahoma City
	St. Anthony Hospital	Oklahoma City
	University Hospitals	Oklahoma City
54.	Washington Hospital Center	Washington, D. C.
	District of Columbia General Hospital	Washington, D. C.
55.	Veterans Admin. Hospital	Des Moines, Iowa
	University Hospitals	Iowa City
56.	Ochsner Foundation Hospital	New Orleans
	Touro Infirmary	New Orleans
57.	Children's Hospital School	Baltimore
	Johns Hopkins Hospital	Baltimore
	Baltimore City Hospital	Baltimore
58.	Akron General Hospital	Akron, Ohio
	Mary Day Nursery and Children's Hospital	Akron, Ohio
59.	Good Samaritan Hospital	Lexington, Ky.
	St. Joseph's Hospital	Lexington, Ky.
60.	Barnes Hospital	St. Louis
	St. Louis City Hospital	St. Louis
	Shriners Hospital for Crippled Children	St. Louis
62.	Alfred I. du Pont Institute of the Nemours Foundation	Wilmington, Del.
	U. S. Naval Hospital	Philadelphia
63.	*Dr. W. H. Groves Latter-Day Saints Hospital*	Salt Lake City
	Primary Children's Hospital	Salt Lake City
64.	Veterans Admin. Hospital	Long Beach, Calif.
	Children's Hospital Center	Los Angeles, Calif.
65.	Children's [illegible]	Denver
	Fitzsimons [illegible]	Denver
66.	Boston City [illegible]	Boston
	Lahey Clinic	Boston
	Massachusetts Hospital School	Canton, Mass.
	Shriners Hospital for Crippled Children	Springfield, Mass.
	Lakeville State Sanatorium	Middleboro, Mass.
67.	Hospital for Crippled Children	Newark, N. J.
	Metropolitan Hospital	New York City
68.	Crippled Children's Clinic & Hospital	Birmingham, Ala.
	Lloyd Noland [illegible]	[illegible] Ala.
69.	Allegheny Gene[illegible]	[illegible] Pa.
	St. Francis Ge[illegible]	[illegible] Pa.
70.	Confederate Memorial Hospital	Shreveport, La.
	Shriners Hospital for Crippled Children	Shreveport, La.
71.	Allegheny General Hospital	Pittsburgh, Pa.
	Youngst[illegible]	[illegible]gstown, Ohio
72.	Children'[illegible]	Philadelphia
	Reading [illegible]	Reading, Pa.
73.	Mississip[illegible]	Jackson, Miss.
	University Hospital	Jackson, Miss.
	Veterans Admin. Hospital	Jackson, Miss.
74.	Veterans Admin. Hospital	Denver
	Carrie Tingley Hospital for Crippled Children	Truth or Consequences, New Mexico
75.	Texas Scottish Rite Hospital for Crippled Children	Dallas, Texas.
	Veterans Admin. Hospital	Dallas, Texas
76.	Jackson Memorial Hospital	Miami, Florida
	Variety Children's Hospital	Miami, Florida
77.	North Carolina Baptist Hospital	Winston-Salem, N. C.
	Shriners Hospital for Crippled Children	Greenville, S. C.
78.	Tampa General Hospital	Tampa, Florida
	American Legion Hospital for Crippled Children	St. Petersburg, Fla.
79.	Orthopaedic Hospital	Los Angeles, Calif.
	St. Mary's Hospital	San Francisco, Calif.
80.	Veterans Admin. Hospital (Manhattan)	New York City
	Rehabilitation Hospital	West Haverstraw, N. Y.
81.	North Carolina Memorial Hospital	Chapel Hill, N. Car.
	North Carolina Orthopedic Hospital	Gastonia, N. Car.
82.	Newington Home and Hospital	Newington, Conn.
	Mary Hitchcock Memorial Hospital	Hanover, N. Hamp.
	Veterans Admin. Hospital	White River Jct., Vt.
83.	Edw. J Meyer Mem'l Hospital	Buffalo, N. Y.
	Allegheny General Hospital	Pittsburgh
84.	Jewish Chronic Disease Hospital	Brooklyn, N. Y.
	Jewish Hospital	Brooklyn, N. Y.

Numerical and other references will be found on pages 640 through 642.

14. ORTHOPEDIC SURGERY—Continued

ORTHOPEDIC SURGERY—PROGRAM IDENTIFICATION

85.	East Tennessee Baptist Hospital	Knoxville, Tenn.
	East Tennessee Crippled Children's Hospital	Knoxville, Tenn.
	St. Mary's Memorial Hospital	Knoxville, Tenn.
	University of Tennessee Memorial Research Center & Hospital	Knoxville, Tenn.
86.	Georgia Baptist Hospital	Atlanta, Ga.
	Eugene Talmadge Memorial Hospital	Augusta, Ga.
	University Hospital	Augusta, Ga.
87.	U. S. Public Health Service Hospital	San Francisco
	Shriners Hospital for Crippled Children	Salt Lake City
88.	University Hospital [illegible]	Baltimore
	James Lawr[illegible] for Cripple[illegible]	Baltimore
89.	Minneapolis General Hospital	Minneapolis
	University of Minnesota Hospitals	Minneapolis
	Gillete State Hospital for Crippled Children	St. Paul
90.	Orthopedic Hospital	Los Angeles
	Shriners Hospital for Crippled Children	Los Angeles
	University of California Hospital	Los Angeles
	Veterans Admin. Hospital	Los Angeles
	Harbor General Hospital	Torrance, Calif.
91.	Veterans Admin. Hospital	Portland, Ore.
	Children's Orthopedic Hospital	Seattle
92.	State Hospital for Crippled Children	Elizabethtown, Pa.
	Hahnemann Medical College Hospital	Philadelphia

15. OTOLARYNGOLOGY

Residency programs in the following hospitals have been approved by the Council, the American Board of Otolaryngology and the American College of Surgeons, through the Residency Relvew Committee for Otolaryngology, as offering acceptable training in the specialty.

Hospitals, 131; Assistant Residencies and Residencies, 495

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered[8]	Total Residencies Offered[8]	Beginning Stipend (Month)
UNITED STATES ARMY							
Army Medical Center[1-3]	Washington, D. C.	H. S. Murphey	1,080	9,936	2	6	...
Brooke Army Hospital[1-3]	San Antonio, Texas	T. L. Hartridge	693	9,699	2	6	...
UNITED STATES NAVY							
U. S. Naval Hospital[1-3]	Oakland, Calif.	M. Schiff	935	7,629	2	4	...
U. S. Naval Hospital[1]	San Diego, Calif.	L. E. Wible	1,461	14,025	2	5	...
U. S. Naval Hospital[1-3]	Bethesda, Md.	S. J. Ryan	2,382	7,763	1	3	...
U. S. Naval Hospital[1-3]	Philadelphia	W. C. Livingood	645	5,712	2	3	...
NONFEDERAL AND VETERANS ADMINISTRATION							
University of Alabama Medical Center							
University Hospital and Hillman Clinic[1-3]	Birmingham, Ala.	F. Moody	793	3,265	1	3	108
Veterans Admin. Hospital[1-3]	Birmingham, Ala.	E. [illegible]	115	146	1	1	...
Los Angeles County Hospital[1-50]	Los Angeles	L. [illegible]	1,536	23,778	3	7	246
Los Angeles Eye and Ear Hospital[1-3-50]	Los Angeles	A. [illegible]	1,659	3,088	..	2	160
University of California Hospital[1-3-64]	Los Angeles	J. J. Pressman	384	3,107	1	3	229
Veterans Admin. Hospital[1-3]	Los Angeles	C. S. Mumma	731	7,735	..	2	...
White Memorial Hospital[1-3]	Los Angeles	L. R. House	1,118	5,867	1	2	215
Harbor General Hospital[1-29]	Torrance, Calif.	S. Kaplan	329	3,260	1	3	246
Stanford Un[illegible]	San Francisco	R. C. McNaught	488	5,231	1	3	100
San Franci[illegible] Service)[1-29]	San Francisco	R. P. Michelson	175	1	..	1	205
University of [illegible]	San Francisco	F. A. Sooy	496	6,291	1	3	231
Children's [illegible]	San Francisco	R. C. Martin	1,114	716	1	1	175
San Francisco Hospital (University of California Service)[1-29]	San Francisco	G. McCoy	116	.....	1	1	205
Veterans Admin. Hospital[1-3-87]	San Francisco	W. P. Work	209	3,483	1	3	...
Grace-New Haven Community Hospital[1-3]	New Haven, Conn.	J. A. Kirchner	896	4,135	1	3	140
Washington Hospital Center[1-3-120]	Washington, D. C.	J. N. Novick	4,269	16,624	2	6	215
Jackson Memorial Hospital[1-3]	Miami, Fla.	J R. Chandler	414	2,487	1	2	75
Tampa General Hospital[1]	Tampa, Fla.	J. B. Farrior	650	1	1	3	250
Grady Memorial Hospital[1]	Atlanta, Ga.	L. A. Brown	.....	1,378	1	3	100
Northwestern University Medical Center							
Chicago Wesley Memorial Hospital[1-3]	Chicago	G. E. Shambaugh, Jr.	1,585	2,880	2	2	125
Cook County Hospital	Chicago	S. J. Pearlman	1,179	20,939	1	4	140
Michael Reese Hospital[1-3-20]	Chicago	N. Leshin	1,864	2,238	1	1	100
Veterans Admin. Research Hospital[1-3-29]	Chicago	G. E. Shambaugh, Jr.	250	3,380	..	1	...
Presbyterian-St. Luke's Hospital							
Presbyterian Hospital Division[1-3]	Chicago	S. A Friedberg	518	2	1	2	125
St. Luke's Hospital Division[1-3]	Chicago	P. H. Holinger	1,047	10	..	..	...
University of Chicago Clinics[1-3]	Chicago	J. R. Lindsay	692	8,835	1	4	200
University of Illinois Hospitals							
[illegible][1-3]	Chicago	F. L. Lederer	961	29,645	6	16	140
[illegible][1-3-132]	Chicago	F. L. Lederer	592	10,316	..	4	140
[illegible]	Hines, Ill.	F. L. Lederer	530	747	3	4	...
[illegible]	......	......	.....	.....	1	4	...
Ve[illegible]	Indianapolis	D. E. Brown	225	5,872	..	..	205
In[illegible]	Indianapolis	M. W. Manion	420	3,761	..	..	165
[illegible] Hospital[1]	Iowa City	D. M. Lierle	2,686	6,219	4	12	175
[illegible]	Iowa City	E. M. Grandon	2,768	5	..	1	...
St[illegible]							
Veterans Ac[illegible]r[1-3]	Kansas City, Kan.	G. O. Proud	835	14,916	1	5	125
University of [illegible]l[1-3-20]	Kansas City, Mo.	P. Barelli	253	4,088	1	3	200
Kansas City [illegible]	Kansas City, Mo.	H. A. Knauff	213	4	..	..	...
Veterans Ac[illegible]ter							
University of [illegible]							
Louisville G[illegible]	Louisville, Ky.	W. C. Wolfe	51	3,030	1	2	83
[illegible] Admin. Hospital[1-3]	Louisville, Ky.	H. Oppenheim	178	1,452	1	2	...
[illegible]f Louisiana							
[illegible]niversity Unit[1]	New Orleans	V. H. Fuchs	673	7,384	2	6	100
[illegible] Unit[1]	New Orleans	H. G. Tabb	922	8,012	2	6	100
[illegible] Throat Hospital[1-3]	New Orleans	C. E. Granberry	3,757	13,757	6	10	100
[illegible] and Throat Hospital[1-3]	Baltimore	J. Snyder	3,380	8,186	1	3	150
[illegible]pital[1-3-164]	Baltimore	J. E. Bordley	1,257	10,135	2	7	160
[illegible]	Baltimore	T. A. Schwartz	1,795	2,187	2	2	275
[illegible]neral Hospital[1-3]	Baltimore	S. L. Fox	867	558	1	3	150
[illegible][1]	Baltimore	C. L. Blanchard	162	1,478	1	3	75
[illegible]al[1-3]	Boston	A. J. Gorney	1,678	16,740	3	7	132
Massachusetts Eye and Ear Infirmary[1-3]	Boston	L. A. Schall	4,002	21,507	6	15	42

Numerical and other references will be found on pages 640 through 642.

15. OTOLARYNGOLOGY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
Massachusetts Memorial Hospitals [1-3-20]	Boston	M. S. Strong	324	789	1	1	175
Beth Israel Hospital [1-3-29]	Boston	B. Zonderman	839	1,598	..	1	167
Veterans Admin. Hospital [1-3]	Boston (Jamaica Plain)	J. C. Trakas	526	2,784	1	3	...
University Hospital [1-3-191]	Ann Arbor, Mich.	A. C. Furstenberg	732	7,749	3	12	160
Harper Hospital [1-3]	Detroit	A. E. Hammond	3,506	2,063	2	6	275
Henry Ford Hospital [1-3]	Detroit	J. L. Dill	1,335	23,899	2	5	250
Receiving Hospital [1-3]	Detroit	J. E. Croushore	612	7,209	1	3	303
University of Minnesota Hospitals [1-3-210]	Minneapolis	L. R. Boies	602	5,442	3	9	200
Minneapolis General Hospital [29]	Minneapolis	B. Bofenkamp	330	2,869	..	1	220
Ancker Hospital [1-3-29]	St. Paul	D. Kusske	303	2,979	..	1	220
Veterans Admin. Hospital [1-3-215]	Minneapolis	H. V. Hanson	186	.....	2	2	...
Mayo Foundation	Rochester, Minn	H. L. Williams	1,550	23,865	2	7	175
Homer G. Phillips Hospital [1-3]	St. Louis	A. J. Cone	215	2,256	2	6	201
St. Mary's Group of Hospitals [1-3]	St. Louis	B. J. McMahon	589	2,394	1	3	100
Washington University Hospitals							
Barnes Hospital [1-3]	St. Louis	T. E. Walsh	3,277	4	3	12	50
McMillan Hospital			.....	.....	..	..	...
St. Louis City Hospital [1-3-29]	St. Louis	G. Hardy	159	4,669	2	3	234
United Hospitals of Newark							
Newark Eye and Ear Infirmary [1-3]—Harrison S. Martland Medical Center [1-3]	Newark, N. J.	E. P. Cardwell	2,664	45	3	9	162
Albany Hospital [1-3]	Albany, N. Y.	B. M. Volk	731	3	1	3	160
Brooklyn Eye and Ear Hospital [1-3]	Brooklyn, N. Y.	J. P. Baker	5,650	32,163	2	6	100
Kings County Hospital							
Division I [1-3]	Brooklyn, N. Y.	H. R. Bancks	619	5,812	1	3	105
Division II [1-3]	Brooklyn, N. Y.	I. J. Polisar	614	4,422	1	3	105
Long Island College Hospital [1-3]	Brooklyn, N. Y.	C. R. Weeth	746	1,055	1	3	156
Buffalo General Hospital [1-3]	Buffalo	H. E. Bozer	738	2	1	3	175
Elmhurst General Hospital [1-3-262]	Elmhurst, N. Y.	C. A. Seelig	296	3,675	1	3	105
Bellevue Hospital Center							
Div. IV-New York University Post-Graduate Medical School [290]	New York City	J. F. Daly	2,365	23,267	4	12	70
Harlem Eye and Ear Hospital [1-3]	New York City	E. Grabscheid	2,909	23,171	1	3	100
Manhattan Eye, Ear and Throat Hospital [1-3]	New York City	D. C. Baker	7,309	37,578	3	9	100
Mount Sinai Hospital [1-3]	New York City	J. L. Goldman	1,651	6,020	1	3	75
New York Eye and Ear Infirmary [1-3]	New York City	J. S. Hanley	2,752	31,867	4	12	50
New York Hospital [1-3]	New York City	J. A. Moore	1,669	9,481	2	4	164
New York Polyclinic Medical School and Hospital [1]	New York City	W. W. Morrison	472	5,717	..	..	125
Presbyterian Hospital [1]	New York City	E. P. Fowler	1,825	18,048	4	8	250
Roosevelt Hospital [1]	New York City	R. C. Grove	589	4,056	1	3	133
St. Luke's Hospital [1-3]	New York City	D. R. McCuaig	713	7,958	1	3	100
Veterans Admin. Hospital (Bronx) [1-3]	New York City	H. Kolson	461	3,852	1	3	...
Strong Memorial—Rochester Municipal Hospital [1-3]	Rochester, N. Y.	C. A. Heatly	1,084	1,912	1	2	117
State University of New York Upstate Medical Center [1-3]	Syracuse, N. Y.	A. Doust	771	2,663	1	3	233
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	N. D. Fischer	111	2,874	..	1	175
Duke University Affiliated Hospitals							
Duke Hospital [1-3]	Durham, N. C.	W. W. Eagle	598	6,109	2	8	127
Veterans Admin. Hospital [1-3-29]	Durham, N. C.	W. W. Eagle	157	.....	..	1	...
McPherson Hospital [1-3]	Durham, N. C.	G. B. Ferguson	1,115	15,253	1	3	200
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	J. A. Harrill	606	1,735	1	3	166
University of Cincinnati College of Medicine Hospital group							
Cincinnati General Hospital [1-3]	Cincinnati	H. Goodyear	634	4,987	1	3	100
Cleveland Clinic Hospital [1-3]	Cleveland	H. E. Harris	1,107	15,904	2	6	175
Cuyahoga County Hospital [1-3-314]	Cleveland	S. C. Missal	326	3,174	1	2	162
St. Luke's Hospital [1-3]	Cleveland	F. W Alexander	2,815	1,683	1	3	140
University Hospitals [1-3]	Cleveland	W. H. Maloney	2,847	2,665	..	2	150
Veterans Admin. Hospital [1-3-29]	Cleveland	V. M. Jordan	275	.....	1	3	...
Ohio State University Hospitals							
Children's Hospital [1]	Columbus, Ohio	E. W. Harris	1,579	.....	..	..	...
University Hospital [1-3]	Columbus, Ohio	E. W. Harris	492	4,296	..	6	202
University of Oklahoma Hospitals [1-3]	Oklahoma City	O. A. Watson	198	2,970	..	2	200
University of Oregon Medical School							
Hospitals and Clinics [1-3]	Portland, Ore.	G. L. Boyden	616	3,447	1	3	125
Veterans Admin. Hospital [1-3-29]	Portland, Ore.	G. Boyden	154	2	..	1	...
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	F. W. Davison	966	9,605	1	3	175
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	B. Shuster	1,165	1,874	2	3	100
Hospital of the University of Pennsylvania [1-3]	Philadelphia	H. Schenck	1,633	3,546	2	6	...
Jefferson Medical College Hospital [1-3]	Philadelphia	F. Harbert	1,463	6,109	1	3	100
Temple University Hospital [1-3-342]	Philadelphia	D. Myers	2,413	2,217	2	6	...
Health Center Hospitals of the University of Pittsburgh School of Medicine							
Eye and Ear Hospital [1-3]	Pittsburgh	T. B. McCollough-K. M. Day.	5,068	5,910	1	4	125
Veterans Admin. Hospital [1-3]	Pittsburgh	S. L. Kyler	981	6	1	3	...
Mercy Hospital [1-3]	Pittsburgh	J. A. Perrone	2,109	.....	1	3	235
Rhode Island Hospital [1-3]	Providence, R. I.	R. W. Pearson	1,741	2,941	1	2	125
Teaching Hospitals of the Medical College of South Carolina	Charleston, S. C.	R. M. Hope	165	996	1	2	137
Medical College Hospital			.....	.....	..	..	...
Roper Hospital			.....	.....	..	..	...
City of Memphis Hospitals [1-3]	Memphis, Tenn.	S Sanders	476	8,107	1	3	150
Veterans Admin. Hospital [1-3]	Memphis, Tenn.	T. C. Maguda	Incl. in Ophthalmology		..	1	...
Veterans Admin. Hospital [1-3-357]	Dallas, Texas	D A. Corgill	415	.....	1	3	...
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	J. M. Robison, Sr.	432	4,344	2	4	160
Baylor University College of Medicine Affiliated Hospitals							
Jefferson Davis Hospital [1-3]	Houston, Texas	H. H. Harris	197	7,020	1	3	75
Methodist Hospital [1-3]	Houston, Texas	J. C. Dickson	872	.....	1	1	220
Veterans Admin. Hospital [1-3]	Houston, Texas	H. H. Harris	313	380	1	3	...

Numerical and other references will be found on pages 640 through 642.

15. OTOLARYNGOLOGY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Outpatient Visits	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
University of Vermont Affiliated Hospitals		R. C. Morrow	944	969	..	..	...
DeGoesbriand Memorial Hospital			.....	.....	..	..	...
Mary Fletcher Hospital [1-3]			.....	.....	..	..	...
University of Virginia Hospital [1]		G. S. Fitz Hugh	1,250	5,528	2	4	50
Medical College of Virginia Hosp	Richmond, Va.	P. N. Pastore	1,568	5,085	2	4	75
Gill Memorial Eye, Ear and Throat Hospital	Roanoke, Va.	E. G. Gill	Incl. in Ophthalmology		..	..	350
University Hospitals [1-3]	Madison, Wis.	C. Taborsky	625	1,839	1	3	100
Veterans Admin. Hospital [1-3]	Milwaukee (Wood), Wis.	R. H. Lehman-G. D. Straus	396	2,692	1	3	...

16. PATHOLOGY

Residency programs in the following hospitals have been approved by the Council and the American Board of *Pathology as offering acceptable* training in the specialty. Services which have been evaluated on the basis of training in the two categories, pathologic *anatomy and clinical* pathology, are designated as follows: a—pathologic anatomy only; c—clinical pathology only; p—pathologic anatomy and clinical pathology.

Hospitals, 671; Assistant Residencies and Residencies, 2,637

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES AIR FORCE										
U. S. Air Force Hospital	San Antonio, Texas	A. A. Kosinski	157	308,467	14,329	12,517	1	3	3^p	...
UNITED STATES ARMY										
Letterman Army Hospital [1-3]	San Francisco	N. Irey	240	655,305	5,775	5,650	2	8	4^p	...
Fitzsimons Army Hospital [1-3]	Denver	H. A. Van Auken	258	309,354	6,589	6,589	2	8	4^p	...
Armed Forces Institute of Pathology [1-3]	Washington, D. C.	E. W. Goodpasture	19,924	......	43,148	43,148	..	20	1^a	...
Army Medical Center [1-3]	Washington, D. C.	R. S. Aronson	334	926,942	6,351	6,343	2	8	4^p	...
Brooke Army Hospital [1-7]	San Antonio, Texas	G. J. Matt	431	960,037	6,184	6,184	2	8	4^p	...
Tripler Army Hospital [1-3]	Honolulu, T. H.	H.-E. Shuey	231	635,589	6,656	6,656	1	4	4^p	...
UNITED STATES NAVY										
U. S. Naval Hospital [1-3]	Oakland, Calif.	H. V. O'Connell	193	198,919	8,394	8,394	1	3	4^p	...
U. S. Naval Hospital [1]	San Diego, Calif.	J. S. Shaver	401	672,796	7,382	7,382	1	5	4^p	...
U. S. Naval Hospital [1-3]	Bethesda, Md.	V. E. Martens	206	408,208	13,467	13,467	3	8	4^p	...
U. S. Naval Hospital [1]	St. Albans, N. Y.	S. S. Sarkisian	100	358,152	8,098	8,048	3	5	4^p	...
U. S. Naval Hospital [1-3]	Philadelphia	B. H. Smith, Jr.	189	264,475	3,503	3,503	3	6	4^p	...
UNITED STATES PUBLIC HEALTH SERVICE										
U. S. Public Health Service Hospital [1-3]	New Orleans	A. L. Steplock	71	185,322	3,386	3,335	1	3	3^p	...
U. S. Public Health Service Hospital [1-3]	Baltimore	J. A. Smith	86	167,721	3,211	3,111	1	4	4^p	...
National Institutes of Health-Clinical Center [1-3]	Bethesda, Md.	H. Stewart-G. Williams	228	264,291	2,048	2,048	5	12	4^p	...
U. S. Public Health Service Hospital [1-3]	Stapleton, S. I., N. Y.	T. L. Perrin	157	249,403	4,312	3,575	2	5	4^p	...
U. S. Public Health Service Hospital [1-3-275]	Seattle	C. S. Powell	128	97,780	3,823	3,394	1	3	2^p	...
NONFEDERAL AND VETERANS ADMINISTRATION										
Birmingham Baptist Hospitals [1-3]	Birmingham, Ala.	A. E. Casey	174	376,505	10,762	10,762	2	6	4^p	200
Carraway Methodist Hospital [1]	Birmingham, Ala.	J. Cunningham—B. Bishop	65	190,104	5,923	5,923	2	2	4^p	250
University of Alabama Medical Center										
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	J. F. A. McManus	384	275,354	6,867	6,837	3	9	4^p	108
Veterans Admin. Hospital [1-3]	Birmingham, Ala.	B. M. Hathaway	171	253,389	2,132	2,132	1	2	3^a	...
Lloyd Noland Hospital [1-3]	Fairfield, Ala.	W. F. Scott, Jr.	107	133,244	2,282	1,930	1	1	1^a	250
Mobile County Hospital [1-3]	Mobile, Ala.	E. B. Wert	402	118,324	1,370	1,370	1	3	2^a	200
Good Samaritan Hospital [1]	Phoenix, Ariz.	J. D. Barger	142	151,202	7,550	6,013	..	1	2^p	300
Maricopa County General Hospital [1-3]	Phoenix, Ariz.	M. Rosenthal	310	173,090	2,026	1,834	..	1	2^a	300
St. Joseph's Hospital [1-3]	Phoenix, Ariz.	L. Stapley	218	194,948	6,731	5,694	1	3	4^p	250
Arkansas Baptist Hospital [1-3]	Little Rock, Ark.	E. L. Wilbur	133	157,524	6,806	4,367	2	3	2^a	400
University Hospital [1-3]	Little Rock, Ark.	H. Schlumberger	469	164,512	7,471	7,471	2	6	4^p	160
Veterans Admin. Hospitals			...	......	....	....	..	..	3^p	...
Veterans Admin. Hospital [1-3]	Little Rock, Ark.	C. F. Shukers	187	214,426	2,187	2,187	1	1	..	...
Veterans Admin. Hospital [1]	North Little Rock, Ark.		57	50,335	412	320	..	..	..	...
Kern County General Hospital [1]	Bakersfield, Calif.	R. W. Huntington, Jr.	283	186,214	2,942	2,820	1	3	4^p	325
Herrick Memorial Hospital [1-3]	Berkeley, Calif.	H. R. Fishback	114	81,686	3,102	3,102	1	3	4^p	175
St. Joseph Hospital [1-3]	Burbank, Calif.	R. Straus	152	150,747	5,703	3,783	1	4	4^p	250
City of Hope Medical Center [1-3]	Duarte, Calif.	G. D. Amromin	212	115,132	4,210	4,210	2	3	1^p	400
San Joaquin General Hospital [1]	French Camp, Calif.	H. J. Schneider	339	145,508	2,865	2,490	1	1	2^a	260
Glendale Sanitarium and Hospital [1]	Glendale, Calif.	A. F. Brown	225	121,410	5,643	4,043	1	4	4^p	325
Loma Linda Sanitarium and Hospital [1-3]	Loma Linda, Calif.	C. S. Small	196	186,245	3,257	3,200	3	9	4^p	215
St. Mary's Hospital [5]	Long Beach, Calif.	T. Kiddie	120	183,408	11,540	7,828	1	3	3^p	300
Seaside Memorial Hospital [1-3]	Long Beach, Calif.	J. A. Tuta	163	192,029	8,653	6,432	2	8	4^p	165
Veterans Admin. Hospital [1-3-55]	Long Beach, Calif.	B. E. Konwaler	577	468,803	5,566	5,566	2	6	4^p	...
California Hospital [1-3]	Los Angeles, Calif.	A. Wright	183	170,225	5,927	4,558	1	3	3^a	225
Cedars of Lebanon Hospital [1-3]	Los Angeles	N. B. Friedman	295	168,173	7,741	7,618	2	6	4^p	265
Children's Hospital [1]	Los Angeles	R. S. Cleland	253	139,232	698	698	1	1	1^a	275
Hospital of the Good Samaritan [1-3]	Los Angeles	L. J. Tragerman	170	144,625	6,564	4,820	2	2	4^p	225
Los Angeles County Hospital [1]	Los Angeles	E. Butt	2,930	837,902	16,700	15,030	4	10	4^p	216
Mount Sinai Hospital [1-3]	Los Angeles	L. Kaplan	82	46,500	2,955	2,823	1	1	1^p	...
Queen of Angels Hospital [1-3]	Los Angeles	J. Cremin	265	180,261	6,101	6,101	1	1	4^p	200
St. Vincent's Hospital [1-3]	Los Angeles	J. E. Kahler	120	136,645	5,093	4,060	1	2	2^p	350
University of California Hospital [1-3]	Los Angeles	S. C. Madden	226	122,663	3,044	2,550	4	10	4^p	229

Numerical and other references will be found on pages 640 through 642.

16. PATHOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered	Total Residencies Offered	Length of Approved Program (Years)	Beginning Stipend (Month)
Veterans Admin. Hospital [1-3]	Los Angeles	B. G. Fishkin	819	609,261	5,275	5,275	4	12	4p	...
White Memorial Hospital [1-3]	Los Angeles	O. B. Pratt	178	311,088	5,811	4,395	2	4	4p	215
Highland Alameda County Hospital [1-3]	Oakland, Calif.	R. J. Parsons	442	141,963	4,713	4,007	1	4	3a	200
[illegible]al [1-3]	Oakland, Calif.	M. Friedman	379	371,953	14,798	11,824	2	5	4p	315
[illegible]	Oakland, Calif.	C. P. Baker	169	165,952	5,305	4,197	1	4	4p	195
[illegible] [1-3]	Oakland, Calif.	B. Gerstl	374	174,934	7,009	4,435	1	4	4p	...
Collis P. and Howard Huntington Memorial Hospital [1-3]	Pasadena, Calif.	D. S. Shillam-R. C. Lewis	183	214,787	10,072	8,568	1	4	4p	200
Sequoia Hospital [1-3]	Redwood City, Calif.	S. Lindsay	120	139,201	5,262	4,543	1	2	2p	350
Sacramento County Hospital [1-3]	Sacramento, Calif.	F. S. Preuss	528	329,624	3,532	2,900	1	4	4p	300
San Bernardino County Charity Hospital	San Bernardino, Calif.	J. D. Kirshbaum	353	129,452	6,535	5,010	2	2	2a	190
Donald N. Sharp Memorial Community Hospital [1-3]	San Diego, Calif.	H. R. Irwin	170	123,939	7,494	4,361	1	2	4p	225
Mercy Hospital [1-3]	San Diego, Calif.	D. A. DeSanto	230	157,979	11,353	9,453	1	4	4p	225
San Diego County General Hospital [1-3]	San Diego, Calif.	L. A. Palmer	249	121,226	2,315	1,847	1	4	4p	250
Franklin Hospital [1]	San Francisco	J. L. Carr	49	28,131	3,102	1,841	..	..	2p	...
French Hospital [1-3]	San Francisco	G. A. Watson	111	90,375	7,117	3,917	1	1	1a	200
Kaiser Foundation Hospital [1-3]	San Francisco	M. L. Bassis	206	268,354	7,051	5,707	1	2	2a	200
Mount Zion Hospital [1-3]	San Francisco	G. R. Biskind	230	149,417	4,639	3,656	1	4	4p	150
St. Francis Memorial Hospital [1-3]	San Francisco	J. L. Zundell	137	82,802	5,888	4,141	1	1	4p	300
St. Luke's Hospital [1-3]	San Francisco	M. Black	114	117,000	1,349	1,349	1	2	2p	325
St. Mary's Hospital [1-3]	San Francisco	A. Moody	106	168,154	6,613	4,819	1	4	4p	200
San Francisco Hospital	San Francisco	...	...	......	.....	.....	..	..	..	...
Stanford University Service [1]		A. J. Cox, Jr.	194	47,000	1,275	1,265	2	3	3a	205
University of California Service [1]		J. L. Carr	343	47,000	1,794	1,794	2	4	3a	205
Stanford University Hospitals [1-3]	San Francisco	L. J. Rather	272	96,932	3,389	3,389	1	4	4p	100
University of California Hospitals [3-78]	San Francisco	H. D. Moon	311	114,905	8,684	8,684	3	12	4p	231
Veterans Admin. Hospital [1-3]	San Francisco	O. N. Rambo-T. V. Feichtmeir	194	167,275	3,061	3,061	1	4	3p	...
O'Connor Hospital [1-3]	San Jose, Calif.	L. R. Grams	168	163,262	6,220	4,074	..	3	4p	350
Santa Clara County Hospital [1-3]	San Jose, Calif.	D. L. Alcott	350	279,079	2,133	2,133	1	4	4p	200
Community Hospital of San Mateo County [1]	San Mateo, Calif.	R. O. Holmes	174	86,759	1,687	1,436	1	1	2a	400
Brookside Hospital [1]	San Pablo, Calif.	C. H. DeMay-C. Rolle, Jr.	113	70,015	3,438	2,655	1	3	2p	500
Santa Barbara Cottage Hospital [1-3]	Santa Barbara, Calif.	E. L. Benjamin	156	103,958	4,019	3,439	2	2	2a	200
St. John's Hospital [1-3]	Santa Monica, Calif.	G. J. Hummer	135	188,446	5,408	4,140	4	4	2a	200
Harbor General Hospital [1-90]	Torrance, Calif.	S. S. Madden	506	326,944	3,794	3,711	2	8	4p	246
Glockner-Penrose Hospital [1-3]	Colorado Springs, Colo.	M. Berthrong	128	82,508	3,135	2,105	1	2	2a	200
Children's Hospital [1-3]	Denver	E. C. Beatty, Jr.	145	149,906	9,368	739	1	2	2p	200
General Rose Memorial Hospital [1-3]	Denver	K. T. Neubuerger	136	117,266	5,360	4,171	..	1	2a	265
Mercy Hospital [1-3]	Denver	E. Hildebrand	136	61,328	4,965	4,648	4	4	2p	225
Porter Sanitarium and Hospital	Denver	W. T. Wikle	98	89,588	4,674	4,030	1	2	1a	250
Presbyterian Hospital [1-3]	Denver	A. E. Lubchenco	134	59,088	6,034	4,953	1	2	4p	275
St. Anthony Hospital [1-3]	Denver	S. K. Kurland	137	101,066	4,875	2,582	2	2	2a	325
St. Joseph's Hospital [1-3]	Denver	S. M. P. Ashe	225	237,572	8,639	8,639	1	4	4p	200
St. Luke's Hospital [1]	Denver	W. C. Black	290	168,890	10,941	7,771	2	6	4p	225
University of Colorado Medical Center										
Colorado General Hospital [1-3]	Denver	J. B. McNaught-J. H. Holmes	385	231,516	9,249	9,246	4	18	4p	250
Denver General Hospital [1-3]	Denver	W. White	425	355,526	10,317	10,317	..	..	4p	250
Veterans Admin. Hospital [1-3-97]	Denver	E. H. Valentine	279	175,577	2,247	2,200	1	3	4p	...
Weld County General Hospital	Greeley, Colo.	L. A. Ridder	115	74,221	2,915	2,154	1	2	2a	300
Colorado State Hospital [1-3-99]	Pueblo, Colo.	M. Gallavan	311	100,123	5,404	4,162	2	8	4p	415
Bridgeport Hospital [1-3]	Bridgeport, Conn.	I. B. Akerson	181	217,982	4,950	3,425	1	4	4p	240
St. Vincent's Hospital [1-3]	Bridgeport, Conn.	A. Ginzler	206	200,436	4,893	4,128	1	2	4p	200
Danbury Hospital [1-3]	Danbury, Conn.	E. Woll	86	77,585	3,059	1,857	1	1	1a	200
Greenwich Hospital [1-3]	Greenwich, Conn.	J. S. Morris	181	91,840	4,312	3,626	1	2	2p	150
Hartford Hospital [1- -102]	Hartford, Conn.	R. E. Kendall	818	17,717	11,954	11,336	2	6	4p	125
St. Francis Hospital [1-3]	Hartford, Conn.	L. P. Hastings	271	246,696	6,972	6,345	2	5	4p	175
Meriden Hospital [1-3]	Meriden, Conn.	R. Katzenstein	118	127,165	3,176	2,776	2	2	2a	100
Middlesex Hospital [1-3]	Middletown, Conn.	C. E. McLeod	173	81,650	3,238	2,045	1	2	2p	200
New Britain General Hospital [1-3]	New Britain, Conn.	P. D. Rosahn	223	207,462	6,375	5,065	1	4	4p	210
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	A. A. Liebow	583	270,000	7,079	7,079	2	3	4p	140
Hospital of St. Raphael	New Haven, Conn.	R. Nesbit	219	141,414	7,646	6,883	1	4	4p	150
Veterans Admin. Hospital [1-3]	Newington, Conn.	R. G. Olivetti	90	125,685	1,461	1,360	1	2	1a	...
Norwalk Hospital [1-3]	Norwalk, Conn.	R. N. Barnett	215	143,186	4,490	3,191	2	2	4p	195
Stamford Hospital [1-3]	Stamford, Conn.	E. S. Breakell	203	159,940	6,105	2,650	1	3	4p	150
St. Mary's Hospital [1-3]	Waterbury, Conn.	M. E. Cox	182	199,053	5,748	4,269	1	4	4p	225
Waterbury Hospital [1]	Waterbury, Conn.	J. O. Collins	217	159,819	4,718	4,718	1	4	4p	225
Veterans Admin. Hospital [1-3-110]	West Haven, Conn.	R. Yesner	134	185,490	2,161	1,855	1	3	2p	...
Delaware Hospital [1-3]	Wilmington, Del.	J. W. Howard	291	263,836	6,475	6,336	1	4	4p	220
Memorial Hospital [1-3]	Wilmington, Del.	J. W. Abbiss	239	132,454	5,826	5,826	1	4	4p	225
Wilmington General Hospital [1-3]	Wilmington, Del.	J. V. Casella	85	118,788	2,376	2,376	1	1	1p	200
Children's Hospital [1-3]	Washington, D. C.	E. C. Rice	127	154,398	725	721	2	2	2p	100
District of Columbia General Hospital [1-3]	Washington, D. C.	D. Weiss	894	288,601	4,520	4,520	2	6	4p	223
Doctors Hospital [1-3]	Washington, D. C.	O. B. Hunter, Jr.	151	194,900	6,293	5,709	2	2	4p	200
Georgetown University Hospital [1-3]	Washington, D. C.	C. F. Geschickter	364	313,252	5,268	5,268	4	10	4p	175
George Washington University Hospital [1-3]	Washington, D. C.	T. M. Peery	341	288,183	7,530	7,330	2	6	4p	150
Providence Hospital [3]	Washington, D. C.	K. McCoy	195	159,232	6,594	6,533	1	4	4p	350
Sibley Memorial Hospital [1-3]	Washington, D. C.	O. B. Hunter	167	172,417	5,438	4,938	1	2	4p	200
Veterans Admin. Hospital [1-3]	Washington, D. C.	J. S. Howe	169	183,464	1,821	1,821	2	5	4p	...
Washington Hospital Center [1-3]	Washington, D. C.	E. C. Rice	395	323,544	9,031	7,832	2	6	4p	215
Veterans Admin. Hospital [2-3]	Coral Gables, Fla.	R. V. Thomson	353	170,716	2,188	2,188	1	4	4p	...
Baptist Memorial Hospital [1-3]	Jacksonville, Fla.	A. G. Foraker	96	89,449	3,102	2,505	1	4	4p	325
Duval Medical Center [1-3]	Jacksonville, Fla.	J. W. Eversole	256	177,133	3,991	3,600	1	2	2a	150
St. Vincent's Hospital [3]	Jacksonville, Fla.	C. M. Whorton	167	139,101	.....	.....	1	4	4p	225
Jackson Memorial Hospital [1-3]	Miami, Fla.	W. A. D. Anderson	785	546,479	17,256	15,253	5	17	4p	75
Mount Sinai Hospital of Greater Miami [1-3]	Miami Beach, Fla.	J. Benson	249	160,928	2,957	2,648	1	5	4p	250
Orange Memorial Hospital [1]	Orlando, Fla.	C. G. Butt	200	137,579	9,640	4,655	1	3	3a	325
Baptist Hospital [1-3]	Pensacola, Fla.	G. V. Squires	248	97,683	4,233	3,994	1	1	4p	225

Numerical and other references will be found on pages 640 through 642.

16. PATHOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered[8]	Total Residencies Offered[8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Crawford W. Long Memorial Hospital[1-3]	Atlanta, Ga.	D. Ayer	165	145,692	7,351	6,550	2	6	4[p]	285
Georgia Baptist Hospital[1]	Atlanta, Ga.	G. L. Forbes	221	194,408	6,864	6,864	2	4	2[p]	305
Grady Memorial Hospital[1]	Atlanta, Ga.	T. D. Raaen	520	365,667	6,273	6,273	5	10	4[p]	100
St. Joseph's Infirmary[1-3]	Atlanta, Ga.	J. T. Godwin	170	145,845	6,042	6,027	1	4	4[p]	270
Veterans Admin. Hospital[1-3]	Atlanta, Ga.	J. Mendeloff	191	183,710	1,658	1,658	1	3	3[p]	...
University Hospital[1]	Augusta, Ga.	M. Ihnen	182	81,096	5,006	4,453	1	2	3[a]	200
Emory University Hospital[1-3]	Emory University, Ga.	W. H. Sheldon	193	141,783	6,868	6,868	2	4	4[p]	235
Memorial Hospital of Chatham County[1-7]	Savannah, Ga.	L. Howard, Jr.	157	37,309	1,683	1,241	1	1	1[a]	350
Alexian Brothers Hospital[3]	Chicago	J. P. Simonds	139	76,000	1,628	1,106	1	1	1[a]	200
American Hospital[1-3]	Chicago	W. F. Eisenstaedt-P. J. Bicknell	133	59,823	1,810	1,743	2	2	1[p]	65
Augustana Hospital[1-3]	Chicago	G. Milles	187	102,600	3,300	2,750	2	2	4[p]	150
Children's Memorial Hospital[1-3]	Chicago	J. Boggs	160	104,816	2,230	2,230	2	2	1[p]	75
Cook County Hospital	Chicago	P. B. Szanto	1,761	588,819	13,500	13,500	4	10	4[p]	140
Edgewater Hospital	Chicago	E. P. Leroy	115	135,579	4,747	3,808	1	2	2[p]	200
Englewood Hospital[3]	Chicago	G. T. Rich	85	64,763	3,845	3,844	1	1	1[a]	200
Grant Hospital[1-3]	Chicago	J. C. Sherrick	152	95,362	3,052	2,290	1	3	3[p]	225
Illinois Masonic Hospital[1-7]	Chicago	L. S. King	213	208,907	3,342	3,024	2	2	4[p]	150
Mercy Hospital[1-3]	Chicago	J. H. Peers	184	120,481	4,209	3,410	1	4	4[p]	200
Michael Reese Hospital[1-3]	Chicago	O. Saphir	483	590,372	8,034	7,530	2	6	4[p]	150
Mount Sinai Hospital[1-3]	Chicago	I. Davidsohn-L. Kreimer	268	386,333	8,236	8,236	2	8	4[p]	275
Northwestern University Medical Center										
Chicago Wesley Memorial Hospital[1-7]	Chicago	T. C. Laipply	278	274,404	6,397	6,397	2	5	4[p]	125
Passavant Memorial Hospital[1-3]	Chicago	W. R. Wartman-M. C. Wheelock	135	147,646	3,450	3,450	1	4	4[p]	125
Veterans Admin. Research Hospital[1-3]	Chicago	J. Robinson	227	182,283	1,705	1,705	2	4	4[p]	...
Evanston Hospital[1-7]	Evanston, Ill.	H. A. Telob	247	201,504	4,072	4,072	1	3	4[p]	225
Norwegian American Hospital	Chicago	A. Learner	74	89,222	3,338	1,684	1	1	1[a]	200
Presbyterian-St. Luke's Hospital										
[illegible] Hospital Division[1-3]	Chicago	G. M. Haas	236	635,535	4,323	4,323	2	6	4[p]	125
[illegible] Division[1-3]	Chicago	E. F. Hirsch	332	312,356	7,701	6,160	1	4	4[p]	125
[illegible][1-3]	Chicago	P. W. Graff	176	102,392	2,470	2,067	1	1	1[a]	200
St. Anne's Hospital[1-3]	Chicago	J. B. Hartney	179	155,589	5,402	3,955	4	4	4[p]	250
St. Joseph Hospital[1-3]	Chicago	G. F. Stevenson	105	95,300	3,337	2,952	1	4	2[p]	300
St. Mary of Nazareth Hospital[1-7]	Chicago	M. C. Godwin	133	220,956	3,897	3,012	1	1	1[a]	200
University of Chicago Clinics[1-3]	Chicago	R. W. Wissler	463	452,742	6,128	5,727	3	8	4[p]	200
University of Illinois Research and Educational Hospitals[1-3]	Chicago	C. A. Krakower	344	639,636	7,496	7,496	1	6	4[p]	200
Veterans Admin. West Side Hospital[1-3-137]	Chicago	B. Chomet	214	300,082	2,059	1,960	2	4	4[p]	...
St. Francis Hospital[1]	Evanston, Ill.	J. W. Henry	262	246,406	6,727	4,973	1	4	4[p]	210
Veterans Admin. Hospital[1-3]	Hines, Ill.	M. Rubnitz	538	630,918	5,084	5,084	2	6	4[p]	...
Methodist Hospital of Central Illinois[3]	Peoria, Ill.	H. I. Brown	151	105,652	6,696	5,064	1	2	4[p]	200
St. Francis Hospital	Peoria, Ill.	J. R. Kraft-E. P. Elzi	292	158,011	6,988	4,657	1	4	4[p]	225
Rockford Memorial Hospital[1-3]	Rockford, Ill.	M. O. Alexander	215	178,409	4,064	3,195	1	4	4[p]	225
St. Anthony Hospital[1-3]	Rockford, Ill.	A. R. K. Matthews	247	100,956	4,052	3,873	1	4	4[p]	200
Carle Memorial Hospital[1]	Urbana, Ill.	H. P. Friedman	65	3,648	2,411	2,411	..	..	1[a]	200
St. Joseph's Hospital[1-3]	Fort Wayne, Ind.	L. A. Schneider	214	160,366	6,351	5,361	2	2	4[p]	250
Methodist Hospital[1-3]	Gary, Ind.	R. A. Burger	222	119,025	3,886	3,632	1	4	4[p]	300
Indianapolis General Hospital[1-3]	Indianapolis	P. V. Evans	437	166,912	2,744	2,705	1	4	4[p]	205
Indiana University Medical Center										
Indiana University Medical Center Hospital[1]	Indianapolis	E. B. Smith	405	311,928	4,526	4,519	4	10	4[p]	167
Veterans Admin. Hospital[1-3]	Indianapolis	D. Rosenbaum	302	171,309	1,662	1,662	..	2	3[p]	...
Methodist Hospital[1]	Indianapolis	L. H. Hoyt	307	648,241	9,223	7,850	2	5	4[p]	278
St. Vincent's Hospital[1-3]	Indianapolis	L. N. Foster	129	195,003	5,858	1,677	1	4	4[p]	275
St. Elizabeth Hospital[1-3]	Lafayette, Ind.	G. B. Stansell	70	131,318	7,531	3,676	1	2	2[a]	275
Ball Memorial Hospital[1]	Muncie, Ind.	L. G. Montgomery	227	211,348	6,057	4,307	1	4	4[p]	250
South Bend Medical Foundation Hospital[1]	South Bend, Ind.	C. S. Culbertson	487	306,177	13,060	10,235	2	6	4[p]	350
Elkhart General Hospital	Elkhart, Ind.									
St. Joseph Hospital	Mishawaka, Ind.									
Memorial Hospital	South Bend, Ind.									
St. J[illegible][1-3]	South Bend, Ind.									
St. L[illegible]	Cedar Rapids, Iowa	R. Weland	164	186,903	8,169	5,446	1	4	3[p]	250
Iowa [illegible]	Des Moines, Iowa	J. W. Green, Jr.	234	198,377	5,877	3,803	1	2	4[p]	200
Mercy [illegible]	Des Moines, Iowa	F. C. Coleman	207	176,177	4,079	4,079	1	4	4[p]	325
Veterans Admin. Hospital[1-3]	Des Moines, Iowa	T. E. Corcoran	162	166,304	2,389	2,389	1	1	4[p]	...
Mercy Hospital[1-3]	Iowa City	K. R. Cross	82	76,052	2,711	1,976	1	1	1[p]	200
State University of Iowa Hospitals[1-3]	Iowa City	E. D. Warner	504	339,618	6,439	6,439	2	8	3[a]	225
Veterans Admin. Hospital[1-3]	Iowa City	K. R. Cross	167	171,581	2,238	2,210	1	4	4[p]	...
Halstead Hospital[1]	Halstead, Kan.	C. A. Hellwig	10	125,219	2,258	1,958	1	3	1[p]	350
University of Kansas Medical Center[1-3]	Kansas City, Kan.	R. Stowell	398	512,613	10,147	9,147	6	20	4[p]	125
Veterans Admin. Hospital[1-3]	Kansas City, Mo.	J. A. Turner	232	241,169	3,781	3,208	..	..	..	...
St. Francis Hospital[1-3]	Wichita, Kan.	W. P. Callahan, Jr.	223	421,303	9,597	9,279	1	4	4[p]	275
Wesley Hospital[1-3]	Wichita, Kan.	B. E. Stofer	166	119,723	7,014	5,562	1	1	4[p]	310
Wichita St. Joseph Hospital[1-3]	Wichita, Kan.	W. J. Beals	160	132,085	8,005	7,447	1	2	2[p]	300
St. Elizabeth Hospital	Covington, Ky.	R. J. Ritterhoff	191	103,168	3,546	2,513	1	2	2[a]	225
Children's Hospital	Louisville, Ky.	I. Diamond	140	49,559	967	587	..	2	1[p]	83
Louisville General Hospital[1-3]	Louisville, Ky.	W. M. Christopherson	289	202,923	4,035	3,720	2	8	3[a]	158
Veterans Admin. Hospital[1-3-140]	Louisville, Ky.	E. L. Foote	195	143,131	2,078	2,073	1	1	4[p]	...
Charity Hospital of Louisiana[1]	New Orleans	E. Moss-C. Dunlap-R. Holman	2,010	1,008,511	19,276	19,276	5	17	4[p]	100
Hotel Dieu—Sister's Hospital	New Orleans	R. M. Hartwell	82	199,380	8,077	8,077	2	4	3[p]	225
Ochsner Foundation Hospital[1-3]	New Orleans	G. M. Carrera	137	162,510	6,176	6,176	1	4	4[p]	225
Southern Baptist Hospital[1]	New Orleans	E. H. Lawson	158	447,843	12,840	12,840	1	4	4[p]	225
Touro Infirmary[1]	New Orleans	A. Hertzog	247	251,843	6,885	6,540	1	3	4[p]	125
Veterans Admin. Hospital[1-3-150]	New Orleans	J. Ziskind	251	189,325	2,043	2,040	1	2	3[p]	...
Confederate Memorial Medical Center[1]	Shreveport, La.	W. R. Mathews	286	315,531	5,901	5,901	1	4	4[p]	125
Eastern Maine General Hospital[1-3]	Bangor, Maine	R. C. Wadsworth	155	147,239	8,205	7,306	1	2	4[p]	125
Central Maine General Hospital[1]	Lewiston, Maine	C. F. Branch	218	66,147	4,723	4,723	1	2	4[p]	225
Maine Medical Center[1]	Portland, Maine	J. E. Porter	186	203,316	5,601	4,314	1	4	4[p]	125
Baltimore City Hospitals[1-3]	Baltimore	A. D. Pollack	508	159,717	3,177	3,177	2	5	3[p]	75
Franklin Square Hospital[1-3]	Baltimore	P. F. Guerin	118	126,761	2,448	2,448	..	2	2[a]	225
Johns Hopkins Hospital[1-3-48]	Baltimore	A. R. Rich	679	294,637	6,134	6,134	4	9	3[a]	100

Numerical and other references will be found on pages 640 through 642.

16. PATHOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered	Total Residencies Offered	Length of Approved Program (Years)	Beginning Stipend (Month)
Lutheran Hospital [1-3]	Baltimore	J. A. Wagner	168	130,000	2,576	2,562	1	1	1^a	220
Maryland General Hospital [1-3]	*Baltimore*	*R. S. Fisher*	177	110,590	3,205	3,201	1	2	1^a	225
Mercy Hospital [1-3]	Baltimore	C. G. Warner	172	482,045	5,834	3,734	1	2	2^a	275
Provident Hospital	Baltimore	H. L. Tseng	98	68,329	615	608	1	1	1^a	225
Sinai Hospital [1-3]	Baltimore	T. Weinberg	179	286,244	11,986	11,986	1	4	4^p	110
Union Memorial Hospital [1-3]	Baltimore	W. C. Merkel	172	153,251	7,549	7,416	1	4	4^p	215
University Hospital [1]	Baltimore	H. I. Firminger	350	374,035	8,143	8,143	3	7	4^p	300
Suburban Hospital [1-3]	Bethesda, Md.	J. E. Ash	190	85,516	2,500	.....	..	2	3^p	325
Prince George's General Hospital [1-3]	Cheverly, Md.	J. C. Burns	153	112,721	3,190	2,972	2	2	2^p	200
Beverly Hospital [1-3]	Beverly, Mass.	R. Fienberg	115	96,545	2,605	2,605	1	1	3^p	150
Beth Israel Hospital [1-3]	Boston	D. Freiman	201	204,656	4,483	4,461	2	5	3^a	167
Boston City Hospital [1-3]	Boston	G. K. Mallory	1,088	55,620	7,091	7,091	3	15	4^p	132
Boston Lying-in Hospital [1-3-30]—Free Hospital For Women [1-3]	Boston	K. Benirschke- D. G. McKay	140	87,478	8,744	8,731	1	2	1^a	75
Carney Hospital [3]	Boston	H. J. Christian	121	175,077	5,334	4,881	1	3	2^a	150
Children's Medical Center	Boston	S. Farber	271	96,151	1,973	1,973	..	3	2^p	...
Faulkner Hospital [1-3]	Boston	P. M. Le Compte	112	64,053	3,044	2,740	..	1	2^p	150
Lemuel Shattuck Hospital [1-3]	Boston	G. W. Curtis	138	75,590	1,082	1,082	3	3	1^a	262
Massachusetts General Hospital [1-3]	Boston	B Castleman	1,014	12,511	12,511	12,511	4	10	4^p	67
Massachusetts Memorial Hospitals [1-3]	Boston	S. C. Sommers	136	88,132	2,154	2,154	..	4	4^p	175
New England Center Hospital [1-3]	Boston	H. E. MacMahon	159	193,208	3,525	3,295	..	4	2^a	160
New England Deaconess Hospital [1-3]	Boston	S. Warren	183	224,410	7,401	7,401	2	10	4^p	200
Peter Bent Brigham Hospital [1-3-170]	Boston	G. J. Dammin	261	164,509	3,162	3,162	3	7	4^p	42
St. Elizabeth's Hospital [1-3]	Boston	J. H. Graham	239	146,540	7,227	5,687	1	2	3^a	125
Veterans Admin. Hospital [1-3]	Boston (Jamaica Plain)	J. D. Houghton	402	434,999	2,695	2,695	2	6	3^p	...
Cambridge City Hospital [1-3]	Cambridge, Mass.	C. W. Jones	115	109,308	3,010	2,960	2	4	2^a	160
Mount Auburn Hospital [1-3]	Cambridge, Mass.	H. E. MacMahon	175	127,509	3,511	3,065	1	2	2^a	155
Truesdale Hospital [1-3-169]	Fall River, Mass.	W. Freeman	67	115,632	1,780	1,017	1	1	1^a	150
Burbank Hospital [1-3]	Fitchburg, Mass.	H. J. Sparling	121	108,260	3,362	3,362	1	1	2^a	...
Holyoke Hosp'tal	Holyoke, Mass.	H. P. Wakefield	149	75,623	3,525	2,679	1	1	1^a	150
Lawrence General Hospital [1-3]	Lawrence, Mass.	L. S. Jolliffe	162	107,194	1,611	1,611	2	2	4^p	250
Lowell General Hospital [1-3]	Lowell, Mass.	R. A. Durham	104	142,723	2,358	1,772	1	1	1^a	...
Lynn Hospital [1-3]	Lynn, Mass.	H. G. Olken	154	134,570	4,613	4,613	5	5	2^p	150
Malden Hospital [1-3]	Malden, Mass.	M. V. MacKenzie	87	67,004	2,921	2,921	1	2	2^p	200
St. Luke's Hospital [1-3]	New Bedford, Mass.	V. Kiarsis	198	240,422	4,904	3,954	1	1	2^a	200
Newton-Wellesley Hospital [1-3]	Newton Lower Falls, Mass.	D. Skinner	142	148,825	5,849	4,023	1	3	3^p	200
Pittsfield General Hospital [1]	Pittsfield, Mass.	W. Beautyman	77	55,449	2,117	1,325	1	1	1^p	300
Quincy Hospital [1-3]	Quincy, Mass.	R. B. Street, Jr.	112	90,752	2,825	2,565	1	4	4^p	179
Salem Hospital [1-3]	Salem, Mass.	D. A. Nickerson	351	101,645	9,186	8,513	1	4	4^p	200
Springfield Hospital [1-3]	Springfield, Mass.	W. Kaufmann	257	164,822	7,811	6,505	2	4	3^a	125
Pondville Hospital	*Walpole, Mass.*	*S. Warren*	*161*	*52,201*	1,699	1,699	..	2	1^p	527
Veterans Admin. Hospital [1-3]	West Roxbury, Mass.	I. Gore	91	119,576	1,116	1,080	1	2	2^p	...
Memorial Hospital [1-3]	Worcester, Mass.	R. C. Sniffen	162	105,210	3,638	3,025	1	1	1^a	200
St. Vincent Hospital	Worcester, Mass.	W. Casale	230	250,559	4,666	4,000	2	4	4^p	175
Worcester City Hospital [1-3]	Worcester, Mass.	W. MacGillivray	307	121,887	3,431	3,131	1	3	4^p	215
University Hospital [1-3-191]	Ann Arbor, Mich.	J. A. French	515	101,595	10,862	10,862	4	16	4^p	160
Leila Y Post Montgomery Hospital [1-3]	Battle Creek, Mich.	A. A. Humphrey	160	78,602	2,362	2,182	..	..	1^a	275
Children's Hospital	Detroit	*W. Zuelzer*	*252*	*162,588*	*469*	*469*	2	2	1^a	200
Grace Hospital [1-3]	Detroit	C. I. Owen	368	328,934	18,075	18,075	1	4	4^p	275
Harper Hospital [1-3]	Detroit	J. R. McDonald	301	313,310	6,641	6,641	1	4	4^p	275
Henry Ford Hospital [1-3]	Detroit	R. C. Horn, Jr.	648	584,309	11,009	11,009	4	16	4^p	250
Mount Carmel Mercy Hospital [1-3]	Detroit	L. W. Gardner	322	264,244	6,340	6,123	2	6	4^p	275
Providence Hospital [1-3]	Detroit	D. H. Kaump	270	207,994	5,662	5,662	1	4	4^p	275
Wayne University Affiliated Hospitals										
Oakwood Hospital [1-3]	Dearborn, Mich.	R. Mainwaring	143	175,378	4,457	4,339	1	4	4^p	250
Veterans Admin Hospital [1-3-195]	Dearborn, Mich.	M. W. Wilson	296	360,835	2,654	2,654	2	7	4^p	...
Detroit Memorial Hospital [1-3-197]	Detroit	J. D. Langston	185	175,457	16,556	16,365	1	2	4^p	425
Herman Kiefer Hospital [1-3]	Detroit	P. Martineau	294	667,264	2,243	2,243	2	2	1^p	303
Receiving Hospital [1-3]	Detroit	O. A. Brines	655	638,935	7,981	7,198	10	17	4^p	303
Sinai Hospital [1-3]	Detroit	S. D. Kobernick	113	149,833	5,322	4,150	1	4	3^p	275
Woman's Hospital [1-3]	Detroit	E. R. Jennings	193	162,900	5,150	5,094	1	1	4^p	475
Wayne County General Hospital and Infirmary [1-3]	Eloise, Mich.	S. E. Gould	351	372,595	4,873	4,777	2	7	4^p	386
Hurley Hospital [1-3]	Flint, Mich.	E. M. Knights	393	269,082	8,290	8,090	1	4	4^p	325
McLaren General Hospital [1]	Flint, Mich.	E. G. Murphy	160	139,899	5,000	5,000	1	4	4^p	350
St. Joseph [illegible]	[illegible] Mich.	....	...	......	....	.....	..	..	4^p	...
Blodgett M [illegible]	[illegible] Mich.	C. A. Payne	320	154,414	8,911	8,552	1	4	4^p	300
Butterworth [illegible]	[illegible] Mich.	J. D. Mann	296	177,632	7,739	5,134	1	4	4^p	300
St. Mary's Hospital [1-3]	*Grand Rapids*, Mich.	H. E. Bowman	180	185,777	5,958	5,130	2	2	1^a	275
W. A. Foote Memorial Hospital	Jackson, Mich.	J. H. Ahronheim	180	71,564	2,880	2,850	1	4	2^p	325
Borgess Hospital [1]	Kalamazoo, Mich.	P Rutherford	148	84,571	3,481	3,069	1	2	2^p	275
Edward W. Sparrow Hospital	Lansing, Mich.	J. F. Dunkel	232	133,061	6,183	5,952	2	2	3^a	250
Pontiac General Hospital [1-3]	Pontiac, Mich.	J. J. Marra	220	140,885	5,064	4,254	1	4	4^p	325
St. Joseph Mercy Hospital [1-3]	Pontiac, Mich.	R. E. Olsen	149	98,046	4,754	4,671	1	3	4^p	325
Saginaw General Hospital [1-3]	Saginaw, Mich.	R. V. Bucklin	256	108,000	4,193	4,139	1	4	4^p	365
St. Luke's Hospital [1-3]	*Duluth, Minn.*	A. H. Wells	383	196,249	7,261	6,961	1	4	4^p	275
St. Mary's Hospital	Duluth, Minn.	A. C. Aufderheide	252	304,268	4,674	3,976	1	2	4^p	200
Minneapolis General Hospital	Minneapolis	J. I. Coe	363	467,848	3,184	2,964	1	3	3^a	220
Northwestern Hospital [1-3]	Minneapolis	F. H. Lott	169	144,979	5,220	4,111	1	2	2^a	200
St. Barnabas Hospital [1-3]	Minneapolis	N. H. Lufkin	195	169,456	6,587	5,239	1	1	2^a	233
Swedish Hospital [1-3]	Minneapolis	A. R. Jay	248	205,117	7,208	4,281	2	2	2^a	200
University of Minnesota Hospitals [1-3]	Minneapolis	J. Dawson	574	619,607	5,188	5,188	8	8	4^p	209
Veterans Admin. Hospital [1-3-215]	Minneapolis	D. F. Gleason	417	402,879	5,541	5,253	2	2	4^p	...
Mayo Foundation	Rochester, Minn.	D. R. Mathieson- J. W. Kernohan	637	1,000,000	26,367	26,367	6	24	4^p	175
Ancker Hospital [1-3]	St. Paul	J. F. Noble	449	224,138	1,694	1,694	1	1	2^a	220
Charles T. Miller Hospital [1-3]	St. Paul	K. Ikeda	161	239,981	6,965	5,614	1	1	4^p	250
St. Joseph's Hospital [1-3]	St. Paul	E. M. James	140	123,726	4.484	3,837	2	2	2^a	250
Mississippi Baptist Hospital [1-3]	Jackson, Miss.	K. M. Heard	136	164,053	5,504	4,911	1	1	4^p	250
University Hospital [1]	Jackson, Miss.	W. V. Hare	276	239,449	4,821	4,809	3	7	4^p	250
St. Louis County Hospital [1-3]	Clayton, Mo.	J. P. Wyatt	198	128,823	1,196	1,089	1	2	2^a	225
University of Missouri Medical Center [1-3]	Columbia, Mo.	J. E. Flynn	74	142,462	4,322	4,260	2	8	2^p	200

Numerical and other references will be found on pages 640 through 642.

16. PATHOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered[8]	Total Residencies Offered[8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Kansas City General Hospital No. 1[1-3]	Kansas City, Mo.	C. B. Wheeler	587	44,026	4,615	3,861	1	4	4[p]	200
Menorah Medical Center[1-3]	Kansas City, Mo.	H. Cohen	160	149,142	6,567	3,459	1	4	4[p]	300
Research Hospital[1-3]	Kansas City, Mo.	H. K. B. Allebach	158	248,959	5,448	4,243	1	4	4[p]	275
St. Joseph Hospital[1-3]	Kansas City, Mo.	R. W. Kerr-V. B. Buehler	275	312,513	8,852	8,325	1	4	4[p]	250
St. Luke's Hospital[1-3]	Kansas City, Mo.	F. C. Helwig	334	270,415	15,724	14,162	2	6	4[p]	310
St. Mary's Hospital[1-3]	Kansas City, Mo.	A. Lapi	205	190,334	6,223	5,240	1	4	4[p]	275
Barnes Hospital[1-3]	St. Louis	W. S. Hartroft	632	556,837	13,740	9,618	..	14	4[p]	50
De Paul Hospital[1-3]	St. Louis	J. D. Bauer	182	176,978	4,758	3,098	2	3	4[p]	200
Homer G. Phillips Hospital[1-3]	St. Louis	J. O. Blache	520	248,742	3,993	3,750	2	4	2[a]	201
Jewish Hospital[1-3]	St. Louis	J. Hasson	258	198,129	4,888	4,550	2	4	4[p]	150
Missouri Baptist Hospital[1-3]	St. Louis	W. R. Platt	132	124,203	5,299	4,624	1	1	4[p]	175
St. John's Hospital[1-3]	St. Louis	H. N. Allen	182	138,838	4,802	3,506	1	2	2[p]	200
St. Louis City Hospital[1-3]	St. Louis	D. S. Johnson	514	277,418	4,274	4,274	4	9	4[p]	231
St. Luke's Hospital[1-3]	St. Louis	R. W. Ogilvie	153	182,840	4,701	3,577	1	2	2[a]	250
St. Mary's Group of Hospitals[1-3]	St. Louis	H. Pinkerton	357	408,054	7,182	7,008	2	8	4[p]	200
Veterans Admin. Hospital[1-3]	St. Louis	R. F. Schaefer	238	166,338	3,954	3,925	..	4	1[a]	...
Montana Deaconess Hospital[1-3]	Great Falls, Mont.	E. J. Eichwald	84	50,000	2,600	2,000	1	1	1[a]	275
Lincoln General Hospital	Lincoln, Neb.	F. H. Tanner	82	82,029	.....	.....	1	1	1[a]	350
Bishop Clarkson Memorial Hospital	Omaha, Neb.	M. Foster	131	153,306	6,282	4,632	..	2	3[p]	300
Creighton Memorial—St. Joseph's Hospital	Omaha, Neb.	V. Moragues	177	220,994	9,400	9,400	1	4	4[p]	210
Nebraska Methodist Hospital[1-3]	Omaha, Neb.	J. R. Schenken	197	107,500	8,500	8,500	2	6	4[p]	300
University of Nebraska Hospital[1-3]	Omaha, Neb.	J. R. Schenken	116	113,784	1,883	1,883	1	4	4[p]	200
Veterans Admin. Hospital[1-3]	Omaha, Neb.	G. J. Haslam	157	142,623	1,758	1,520	1	3	3[a]	...
Mary Hitchcock Memorial Hospital[1-3]	Hanover, N. H.	R. E. Miller	197	177,231	3,951	3,468	1	4	4[p]	218
Atlantic City Hospital[1]	Atlantic City, N. J.	M. Ackerman	246	98,885	3,437	3,437	1	2	2[a]	200
Cooper Hospital[1-3]	Camden, N. J.	W. T. Read, Jr.	427	208,272	5,969	5,914	1	1	2[p]	200
Our Lady of Lourdes Hospital[1-3]	Camden, N. J.	R. L. Breckenridge	163	155,028	3,522	2,408	1	2	2[p]	250
West Jersey Hospital[1-3]	Camden, N. J.	E. E. Ziegler	120	147,893	4,568	3,974	1	3	3[a]	225
Veterans Admin. Hospital[1-3]	East Orange, N. J.	O. Auerbach	284	247,601	1,804	1,804	..	1	3[a]	...
Englewood Hospital[1-3]	Englewood, N. J.	I. A. Gaspar	130	182,209	5,561	4,477	1	1	1[a]	150
Hunterdon Medical Center[1-3]	Flemington, N. J.	E. V. Olmstead	119	64,127	1,508	1,400	1	1	1[a]	200
Hackensack Hospital[1-3]	Hackensack, N. J.	D. E. Brown	187	141,513	4,286	4,286	2	4	4[p]	150
St. Mary's Hospital[1-3]	Hoboken, N. J.	A. Ehrlich	130	57,027	1,763	1,756	1	2	2[a]	150
Christ Hospital[1-3]	Jersey City, N. J.	A. Gitlitz	130	128,667	7,046	6,439	1	4	2[p]	175
Jersey City Medical Center	Jersey City, N. J.	A. M. Gnassi	361	281,832	10,777	10,777	3	6	2[a]	145
Monmouth Memorial Hospital[1-3]	Long Branch, N. J.	M. Rush	200	147,751	3,636	3,420	1	2	2[a]	200
Mountainside Hospital[1-3]	Montclair, N. J.	J. L. Work	406	162,368	9,119	4,450	1	3	3[p]	250
Morristown Memorial Hospital[1-3]	Morristown, N. J.	H. F. Luddecke	199	175,843	4,842	4,819	1	3	4[p]	185
Burlington County Hospital[1-3]	Mount Holly, N. J.	J. F. Bauer	168	73,698	1,789	1,789	..	2	2[a]	100
Fitkin Memorial Hospital[1-3]	Neptune, N. J.	R. E. Conover	125	147,377	2,732	2,732	2	2	2[a]	200
Harrison S. Martland Medical Center[1-3]	Newark, N. J.	E. Albano	365	279,693	2,184	2,184	2	6	3[a]	162
Newark Beth Israel Hospital[1-3]	Newark, N. J.	L. Goldman-M. Kannerstein	231	90,010	6,219	5,700	1	3	4[p]	100
St. Barnabas Medical Center[1-3]	Newark, N. J.	W. G. Bernhard	80	82,406	3,386	3,149	1	3	3[p]	150
St. Michael's Hospital[1-3]	Newark, N. J.	S. J. Rose	215	153,907	7,578	7,578	3	3	4[p]	165
United Hospitals of Newark Presbyterian Hospital[1-3]	Newark, N. J.	S. A. Goldberg	113	149,023	6,390	4,975	1	2	3[p]	175
St. Peter's General Hospital[1-3]	New Brunswick, N. J.	W. A. Jarrett	144	61,208	4,143	2,706	1	2	2[a]	175
Orange Memorial Hospital[1-3]	Orange, N. J.	A. R. Abel	173	101,799	3,586	3,570	1	4	4[p]	150
Bergen Pines County Hospital[1-3]	Paramus, N. J.	V. H. Gillson	346	118,497	....	....	1	2	2[a]	200
Passaic General Hospital[1-3]	Passaic, N. J.	J. R. Gannon	117	95,514	3,250	2,836	..	2	3[p]	250
St. Mary's Hospital[1-3]	Passaic, N. J.	R. Brill	151	72,910	2,704	2,644	1	2	2[p]	200
Barnert Memorial Hospital[1-3]	Paterson, N. J.	J. Churg	115	98,168	4,118	3,363	1	2	1[a]	200
Paterson General Hospital[1-3]	Paterson, N. J.	A. H. Davis	100	71,281	5,371	4,592	1	2	2[p]	150
St. Joseph Hospital[1-3]	Paterson, N. J.	G. B. Kim	222	209,823	5,224	5,224	2	2	4[p]	200
Perth Amboy General Hospital[3]	Perth Amboy, N. J.	H. Y. Tyler	99	153,500	8,767	7,282	..	..	1[a]	200
Overlook Hospital[1-3]	Summit, N. J.	G. L. Erdman	154	134,214	4,773	4,117	1	2	2[p]	150
Mercer Hospital[1-3]	Trenton, N. J.	T. K. Rathmell	172	128,224	2,365	2,365	..	1	4[p]	250
St. Francis Hospital[1-3]	Trenton, N. J.	S. Weintraub	250	211,514	10,796	6,076	1	2	2[a]	210
Bataan Memorial Methodist Hospital[1-3]	Albuquerque, N. Mex.	T. L. Chiffelle	119	30,604	2,282	2,282	1	2	4[p]	250
Bernalillo County-Indian Hospital	Albuquerque, N. Mex.	N. E. Pond-H. V. Beighley	165	161,299	2,005	1,422	1	4	4[p]	350
Veterans Admin. Hospital	Albuquerque, N. Mex.	W. Hentel	133	210,629	1,657	1,657	1	2	2[p]	...
Albany Hospital[1-3]	Albany, N. Y.	A. W. Wright	431	155,153	7,928	7,828	1	6	4[p]	200
Bender [illegible] Hospitals[1-3]	Albany, N. Y.	J. J. Clemmer	350	419,679	10,366	10,366	2	6	4[p]	250
Antho[illegible] ty Home	Albany, N. Y.	.....	...	......	.....	.....	..	..	..	...
Memo[illegible]	Albany, N. Y.	.....	...	......	.....	.....	..	..	..	...
St. P[illegible]	Albany, N. Y.	.....	...	......	.....	.....	..	..	..	...
Veteran[illegible]	Albany, N. Y.	T. S. Beecher	280	213,672	2,407	2,407	1	2	3[p]	...
Bingham[illegible] C[illegible]	Binghamton, N. Y.	F. P. Becker	151	113,976	8,306	2,800	1	3	4[p]	225
Lawrence Hospital[1-3]	Bronxville, N. Y.	A. A. Eggston	75	70,766	2,101	1,752	1	1	1[p]	225
Beth El Hospital[1-3]	Brooklyn, N. Y.	D. M. Spain	91	356,430	4,582	4,491	1	1	1[p]	150
Brooklyn Hospital[1-3]	Brooklyn, N. Y.	J. A. De Veer	191	120,948	4,910	4,700	1	4	4[p]	175
Coney Island Hospital[1-3]	Brooklyn, N. Y.	H. Fink	213	368,905	1,263	1,263	2	4	4[p]	105
Cumberland Hospital[1-3]	Brooklyn, N. Y.	S. H. Polayes	132	225,945	1,871	1,737	1	3	4[p]	105
Greenpoint Hospital[1-3]	Brooklyn, N. Y.	R. Aronoff	124	121,342	1,242	1,236	2	3	3[p]	105
Jewish Chronic Disease Hospital[1-3]	Brooklyn, N. Y.	B. W. Volk	81	302,569	670	670	1	4	2[c]	225
Jewish Hospital[1-3]	Brooklyn, N. Y.	D. Grayzel	201	500,000	6,613	5,638	2	5	4[p]	100
Kings County Hospital Center	Brooklyn, N. Y.	P. J. Fitzgerald	1,338	714,915	13,873	10,974	5	20	4[p]	105
Long Island College Hospital[1-3]	Brooklyn, N. Y.	T. G. Morrione	163	161,341	4,875	4,625	1	3	4[p]	156
Lutheran Medical Center[1-3]	Brooklyn, N. Y.	E. S. Wedding	108	158,062	2,150	2,150	2	2	1[a]	185
Maimonides Hospital[1-3]	Brooklyn, N. Y.	A. R. Kantrowitz	213	356,159	5,739	5,739	3	6	4[p]	75
Methodist Hospital[1-3]	Brooklyn, N. Y.	B. S. Herr, Jr.	116	116,856	3,804	3,785	1	3	3[p]	175
St. Catherine's Hospital[1-3]	Brooklyn, N. Y.	M. Wachstein	105	107,063	1,653	1,653	1	2	3[a]	125
St. John's Episcopal Hospital[1-3]	Brooklyn, N. Y.	L. M. Fox	70	109,233	5,155	5,155	1	2	2[p]	175
St. Mary's Hospital[1-3]	Brooklyn, N. Y.	W. Moltrier	71	125,627	4,149	4,149	1	2	2[p]	200
Veterans Admin. Hospital[1-3]	Brooklyn, N. Y.	M. Bovarnick	303	306,430	3,511	3,511	1	2	4[p]	...
Buffalo General Hospital[1-3]	Buffalo	K. L. Terplan-S. L. Vaughan	458	10,283	7,943	7,824	3	6	3[p]	175
Deaconess Hospital[1-3]	Buffalo	S. Tannhauser	161	140,838	5,076	4,210	1	2	3[p]	200
Edward J. Meyer Memorial Hospital[1-3]	Buffalo	S. Sanes	403	464,710	5,020	5,020	1	3	2[a]	247
Millard Fillmore Hospital[1-3]	Buffalo	A. V. Postoloff	323	296,794	6,975	6,975	1	3	4[p]	235

Numerical and other references will be found on pages 640 through 642.

16. PATHOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered	Total Residencies Offered	Length of Approved Program (Years)	Beginning Stipend (Month)
Roswell Park Memorial Institute [1-3]	Buffalo	J. W. Pickren	400	136,461	1,920	1,915	2	10	2[p]	318
Veterans Admin. Hospital [1-3]	Buffalo	J. B. Sheffer	249	330,496	1,949	1,559	1	2	3[p]	...
Mary Imogene Bassett Hospital [1-3]	Cooperstown, N. Y.	C. V. Z. Hawn	130	110,986	1,919	1,808	1	2	2[a]	200
Elmhurst General Hospital [1-3]	Elmhurst, N. Y.	I. Chapman	211	120,523	2,133	1,743	2	6	4[p]	165
Arnot Ogden Memorial Hospital [1-3]	Elmira, N. Y.	B. Juvelier	86	94,724	3,723	3,494	1	1	1[a]	250
St. Joseph's Hospital	Elmira, N. Y.	J. A. Mitchell	113	156,460	2,908	1,995	1	1	2[a]	300
Flushing Hospital and Dispensary [1-3]	Flushing, N. Y.	I. Garrow	185	128,916	4,198	4,198	1	4	4[p]	175
Community Hospital at Glen Cove [1-3]	Glen Cove, N. Y.	T. Robertson	107	110,327	3,483	2,537	2	2	2[p]	300
Glens Falls Hospital [1-3]	Glen Falls, N. Y.	M. Maslon	133	100,615	4,134	3,634	..	1	3[p]	250
Meadowbrook Hospital [1-3]	Hempstead, N. Y.	V. S. Palladino	683	390,381	4,322	4,287	3	12	4[p]	225
Mary Immaculate Hospital [1-3]	Jamaica, N. Y.	T. J. Hartnett	94	112,950	7,795	2,589	1	2	1[a]	160
Queens Hospital Center [1-3]	Jamaica, N. Y.	G. Silverman	672	537,650	4,852	4,852	5	9	4[p]	71.25
Charles S. Wilson Memorial Hospital [1-3]	Johnson City, N. Y.	N. Elton	218	173,837	5,463	4,553	1	4	4[p]	225
Kingston Laboratory Hospitals [1-3]		H. Derman	185	208,524	5,301	5,301	1	4	2[p]	250
Kingston Hospital	Kingston, N. Y.	...	...	......	.....	.....	..	..	..	...
Benedictine Hospital	Kingston, N. Y.	...	...	......	.....	.....	..	..	..	...
Ulster County Tuberculosis Hospital	Kingston, N. Y.	...	...	......	.....	.....	..	..	..	...
St. John's Long Island City Hospital [1-3]	Long Island City, N. Y.	E. Santora	117	65,086	1,790	1,713	1	1	1[p]	200
North Shore Hospital [1-3]	Manhasset, N. Y.	S. Gross	82	118,011	2,942	2,467	..	1	1[p]	250
Nassau Hospital [3]	Mineola, N. Y.	L. Ferraro	137	90,369	8,644	3,779	1	2	4[p]	325
Mount Vernon Hospital [1-3]	Mount Vernon, N. Y.	J. G. Sharnoff	180	1,018,552	4,480	4,480	1	2	3[p]	200
Long Island Jewish Hospital [1-3]	New Hyde Park, N. Y.	J. I. Berkman	195	235,728	6,749	5,259	1	3	3[p]	75
New Rochelle Hospital [1-3]	New Rochelle, N. Y.	W. C. Schraft	151	128,156	3,207	3,207	1	1	3[a]	225
Bellevue Hospital Center Div. III—New York University College of Medicine	New York City	M. Kuschner	728	677,375	7,023	7,023	10	16	4[p]	300
Beth Israel Hospital [1-3]	New York City	W. Antopol	109	133,568	4,985	4,975	1	4	4[p]	135
Bronx Hospital [1-3]	New York City	L. Reiner	107	189,327	3,334	3,302	1	2	2[p]	100
Bronx Municipal Hospital Center [1-3]	New York City	A. A. Angrist	380	478,188	3,698	3,698	3	12	4[p]	125
Doctors Hospital [1-3]	New York City	S. Trinidad	78	97,968	3,611	3,577	2	2	1[a]	300
Fordham Hospital [1-3]	New York City	L. J. Millman	256	126,224	2,126	2,126	1	2	3[a]	105
Francis Delafield Hospital [1-3]	New York City	H. P. Smith	233	87,396	5,215	5,215	..	6	3[a]	105
Goldwater Memorial Hospital [1-3]	New York City	J. Rosenthal	123	87,508	413	413	2	3	2[p]	105
Harlem Hospital [1-3]	New York City	V. B. Dolgopol	349	324,831	3,590	3,590	1	4	4[p]	105
Hospital for Joint Diseases [1-3]	New York City	H. L. Jaffe	43	92,414	2,651	2,651	2	2	1[a]	80
Jewish Memorial Hospital [1-3]	New York City	A. Schwarz	97	109,130	2,028	1,919	1	2	2[p]	150
Knickerbocker Hospital [1-3]	New York City	W. B. Ober	97	70,028	1,577	1,563	1	2	1[a]	150
Lebanon Hospital [1-3]	New York City	J. C. Ehrlich	113	182,196	4,082	4,082	..	4	3[p]	100
Lenox Hill Hospital [1-3]	New York City	S. R. Opler	150	103,227	4,555	3,192	1	4	4[p]	180
Lincoln Hospital [1-3]	New York City	H. Lepow	158	144,943	2,915	2,915	1	2	4[p]	105
Memorial Center for Cancer and Allied Diseases [1-3]	New York City	F. W. Stewart	451	467,947	18,168	18,168	..	10	3[a]	300
James Ewing Hospital		...	...	......	.....	.....	..	..	..	...
Memorial Hospital		...	...	......	.....	.....	..	..	..	...
Misericordia Hospital [1-3]	New York City	H. D. Bucalo, Jr.	46	63,563	4,018	2,009	1	1	1[a]	125
Montefiore Hospital [1-3]	New York City	H. Zimmerman	462	251,966	5,393	5,393	2	7	3[p]	187
Morrisania City Hospital [1-3]	New York City	M. R. Dacso	226	131,230	2,356	2,325	2	4	4[p]	105
Mount Sinai Hospital [1-3]	New York City	H. Popper	466	399,258	10,030	10,030	5	11	4[p]	75
New York Hospital [1-3]	New York City	J. G. Kidd-J. Pearce	482	484,928	8,754	8,006	2	5	4[p]	164
New York Medical College-Metropolitan Medical Center										
Flower and Fifth Avenue Hospitals [1-3]	New York City	F. Speer	97	186,508	6,985	5,761	2	6	4[p]	...
Metropolitan Hospital [1-3]	New York City	F. Speer	317	327,842	3,535	3,464	1	4	4[p]	105
New York Polyclinic Medical School and Hospital [1]	New York City	W. E. Finkelstein	103	91,007	4,503	4,344	1	2	3[a]	125
New York University-Bellevue Medical Center										
University Hospital	New York City	M. Richter	166	1,024,356	6,009	5,279	1	3	2[a]	105
Presbyterian Hospital [1]	New York City	H. P. Smith-R. Lattes	584	541,010	9,944	9,944	2	7	4[p]	250
Roosevelt Hospital [1]	New York City	B. Kalfayan	171	165,582	4,288	4,288	2	3	2[a]	133
St. Barnabas Hospital for Chronic Diseases [1-3]	New York City	G. K. Higgins	167	100,366	1,449	1,449	1	3	2[p]	75
St. Clare's Hospital [1-3]	New York City	J. M. Ravid	121	121,587	3,549	3,549	1	2	2[p]	200
St. Francis Hospital [1-3]	New York City	T. Ehrenreich	78	114,417	2,620	2,620	1	1	1[p]	125
St. Luke's Hospital [1-3]	New York City	C. F. Begg	210	176,540	3,809	3,809	1	4	4[p]	100
St. Vincent's Hospital [1-3]	New York City	A. Rottino	439	274,925	4,765	4,765	1	3	3[a]	200
Veterans Admin. Hospital (Bronx) [1-3-254]	New York City	B. S. Gordon	422	523,088	4,104	4,104	2	5	4[p]	...
Veterans Admin. Hospital (Manhattan) [1-3]	New York City	S. L. Wilens	343	360,434	3,615	3,326	2	6	4[p]	...
United Hospital [1-3]	Port Chester, N. Y.	M. Loder	80	94,250	4,539	982	1	1	1[p]	200
Vassar Brothers Hospital	Poughkeepsie, N. Y.	...	143	109,948	3,958	3,700	1	2	2[p]	...
Genesee Hospital [1-3]	Rochester, N. Y.	J. Abbott	273	174,584	4,871	4,823	1	2	2[a]	175
Rochester General Hospital [1-3]	Rochester, N. Y.	M. G. Bohrod	362	212,951	10,785	8,088	2	8	4[p]	125
St. Mary's Hospital [1-3]	Rochester, N. Y.	J. Adler	259	161,119	4,451	3,780	1	4	4[p]	230
Strong Memorial-Rochester Municipal Hospital [1-3]	Rochester, N. Y.	J. L. Orbison	566	......	5,543	5,543	4	10	3[a]	117
Ellis Hospital [1-3]	Schenectady, N. Y.	E. Kellert	230	252,541	5,418	5,418	2	3	3[p]	150
St. Vincent's Hospital [1-3]	Staten Island, N. Y.	V. Kogan	109	92,514	3,087	3,009	1	1	1[a]	240
Sea View Hospital [1-3-13]	Staten Island, N. Y.	V. Altmann	129	125,429	267	267	1	1	1[a]	157
Staten Island Hospital [1-3]	Staten Island, N. Y.	V. Altmann	96	779,807	2,093	2,093	1	1	1[a]	200
St. Joseph's Hospital [1-3]	Syracuse, N. Y.	H. J. Dick	154	162,155	3,509	3,500	1	1	2[p]	233
State University of New York										
Upstate Medical Center [1-3]	Syracuse, N. Y.	J. H. Ferguson	402	......	8,447	8,447	2	6	3[a]	233
Veterans Admin. Hospital [1-3]	Syracuse, N. Y.	J. A. Schaefer	157	146,578	2,034	1,994	1	1	3[p]	...
Samaritan Hospital [1-3]	Troy, N. Y.	C. G. Burn	121	75,720	2,699	2,000	1	1	1[a]	300
Utica State Hospital [1-3]	Utica, N. Y.	N. M. Levine	81	75,274	144	144	1	2	4[p]	487
Grasslands Hospital [1-3]	Valhalla, N. Y.	V. A. Bradess	634	280,776	3,636	3,091	1	3	4[p]	175
St. John's Riverside Hospital [1-3]	Yonkers, N. Y.	C. De Angelis	79	68,764	1,802	1,706	1	1	1[p]	250
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	K. M. Brinkhous	275	23,721	12,403	12,403	3	12	4[p]	208
Charlotte Memorial Hospital [1]	Charlotte, N. C.	F. Germuth, Jr.	247	176,333	7,869	7,655	1	4	4[p]	250
Presbyterian Hospital	Charlotte, N. C.	H. L. Large	104	115,670	4,773	4,614	1	2	2[a]	250
Duke University Affiliated Hospitals										
Duke Hospital [1-3]	Durham, N. C.	W. D. Forbus	354	638,879	7,398	7,398	1	4	4[p]	150
Veterans Admin. Hospital [1-3]	Durham, N. C.	R. D. Baker	175	182,658	2,318	2,318	..	4	4[p]	...
Watts Hospital [1-3]	Durham, N. C.	J. U. Gunter	85	174,273	5,394	5,360	..	1	2[p]	325
Moses H. Cone Memorial Hospital [1-3]	Greensboro, N. C.	H. Z. Lund	180	103,821	4,767	4,069	1	4	4[p]	400
Veterans Admin. Hospital [1]	Oteen, N. C.	O. Kanner	176	304,183	1,683	1,683	1	1	1[p]	...

Numerical and other references will be found on pages 640 through 642.

16. PATHOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	R. P. Morehead	290	....	36,949	36,949	2	7	4^P	166
Akron City Hospital [1-3]	Akron, Ohio	L. Catron	393	323,543	8,110	8,110	1	3	4^P	250
Akron General Hospital [1]	Akron, Ohio	G. R. Dochat	206	268,626	6,485	5,338	2	8	4^P	250
Aultman Hospital [1-3]	Canton, Ohio	F. J. Raisch	198	296,108	30,764	30,764	1	4	4^P	275
Mercy Hospital [1-3]	Canton, Ohio	A. Raftery	213	175,673	3,533	3,148	1	4	4^P	200
Bethesda Hospital [1-3]	Cincinnati	J. Hamblet	253	58,626	4,389	3,253	1	3	3^P	260
University of Cincinnati College of Medicine Hospital Group										
Cincinnati General Hospital [1-3]	Cincinnati	E. A. Gall	630	143,387	4,626	4,626	3	7	4^P	100
Good Samaritan Hospital [1-3]	Cincinnati	L. Z. Gordon	243	224,000	12,387	5,153	1	3	3^A	250
Jewish Hospital [1-3]	Cincinnati	P. Wasserman	262	298,435	7,748	6,744	1	4	3^P	195
Cleveland Clinic Hospital [1-3]	Cleveland	J. B. Hazard	330	668,964	8,884	8,880	2	8	4^P	175
Cuyahoga County hospital [1-3]	Cleveland	T. D. Kinney	344	290,653	2,829	2,829	6	12	4^P	162
Evangelical Deaconess Hospital [1]	Cleveland	V. S. Hirsch	127	86,685	3,285	3,235	..	..	2^A	225
Huron Road Hospital [1-3]	Cleveland	E. Goodsitt	180	218,864	5,506	5,506	2	2	4^P	210
Lutheran Hospital [1-3]	Cleveland	W. Sinclair, Jr.	141	82,774	2,716	2,623	1	3	2^P	250
Mount Sinai Hospital [1-3]	Cleveland	H. Goldblatt	291	469,786	6,808	6,808	1	4	4^P	215
St. Luke's Hospital [1-3]	Cleveland	R. Dominguez	280	343,644	6,141	5,743	1	4	4^P	140
St. Vincent Charity Hospital [1-3]	Cleveland	J. S. Mackrell, Jr.	202	216,882	4,984	4,984	2	8	4^P	210
University Hospitals [1-3]	Cleveland	A. R. Moritz	493	487,085	9,601	9,601	3	10	4^P	150
Veterans Admin. Hospital [1-3-318]	Cleveland	J. R. Kahn	269	275,737	3,367	3,030	1	4	4^P	...
Children's Hospital [1]	Columbus, Ohio	W. A. Newton, Jr.	193	107,867	2,814	2,761	1	3	1^P	175
Grant H[illegible]	Columbus, Ohio	B. H. Hurd	135	131,309	5,481	5,467	2	2	1^A	300
Ohio St[illegible]										
University Hospital [1-3]	Columbus, Ohio	E. Von Haam	655	829,749	50,145	50,145	4	16	4^P	177
White Cross Hospital [1-3]	Columbus, Ohio	R. J. Johansmann	170	216,696	10,095	10,095	1	3	3^A	290
Miami Valley Hospital [1-3]	Dayton, Ohio	M. Oosting	804	441,184	8,969	8,969	3	12	4^P	200
Veterans Admin. Hospital [1-3]	Dayton, Ohio	G. P. Herrera	291	201,418	1,865	1,865	1	1	3^P	...
Elyria Memorial Hospital [1-3]	Elyria, Ohio	R. G. Thomas	96	110,628	12,944	12,944	2	2	2^P	270
Mercy Hospital [1-3]	Hamilton, Ohio	K. Lande	186	119,602	2,034	2,034	1	3	1^A	200
St. Rita's Hospital [1-3]	Lima, Ohio	C. L. Blumstein	205	146,181	4,544	3,452	1	4	4^P	400
Springfield City Hospital [1-3]	Springfield, Ohio	R. E. Wybel	167	117,278	4,687	3,841	1	2	2^A	300
Maumee Valley Hospital [1-3]	Toledo, Ohio	J. G. Snavely	148	116,993	1,315	1,215	1	1	4^P	285
Mercy Hospital [1-3]	Toledo, Ohio	E. L. Burns	197	156,162	6,003	5,036	1	4	4^P	275
St. Vincent's Hospital [1-3]	Toledo, Ohio	M. F. Vidoli	263	212,689	6,735	4,821	2	2	2^A	325
Toledo Hospital [1-3]	Toledo, Ohio	B. Steinberg	262	138,721	4,949	4,614	1	4	4^P	275
Trumbull Memorial Hospital [1]	Warren, Ohio	R. J. Williams	135	94,209	3,604	3,422	1	2	2^A	300
St. Elizabeth Hospital [1-3]	Youngstown, Ohio	J. Lo Cricchio	205	181,080	9,688	7,156	1	2	4^P	300
Youngstown Hospital [1-3]	Youngstown, Ohio	A. E. Rappoport	481	352,441	6,819	6,064	2	8	4^P	325
St. Anthony Hospital	Oklahoma City	W. T. Snoddy	147	241,273	7,264	5,431	1	3	4^P	300
University of Oklahoma Hospitals [1-3-320]	Oklahoma City	W. E. Jaques	295	240,577	4,425	3,501	1	4	4^P	200
Hillcrest Medical Center [1]	Tulsa, Okla.	L. Lowbeer	192	159,379	6,961	5,100	2	6	4^P	200
St. John's Hospital	Tulsa, Okla.	E. E. Palik	213	271,611	8,511	6,586	2	8	4^P	175
Emanuel Hospital [1-3]	Portland, Ore.	V. D. Sneeden	293	210,507	8,862	6,632	1	3	3^A	275
G[illegible] Hospital [1-3]	Portland, Ore.	W. L. Lehman	177	335,872	12,049	9,944	1	4	4^P	275
P[illegible] [1-3]	Portland, Ore.	J. Minckler	242	351,519	4,164	3,552	1	4	4^P	275
[illegible] [1-3]	Portland, Ore.	J. E. Noblgren	276	268,140	10,253	9,053	1	4	4^P	275
[illegible] Medical School Hospitals and Clinics [1-3]	Portland, Ore.	W. C. Hunter-R. Grondahl	416	287,318	3,687	3,687	4	8	4^P	125
Veterans Admin. Hospital [1-3-334]	Portland, Ore.	E. J. Losli	313	196,694	3,050	3,000	1	1	2^A	...
Abington Memorial Hospital [1-3]	Abington, Pa.	J. W. Elman	262	262,510	3,585	3,585	1	4	4^P	150
Allentown Hospital [1-3]	Allentown, Pa.	R. E. Bovard	318	281,968	5,860	5,163	1	4	4^P	225
Sacred Heart Hospital [1-3]	Allentown, Pa.	D. E. Stader	115	154,889	5,977	5,648	1	2	2^C	225
Altoona Hospital [1-3]	Altoona, Pa.	G. J. Held, Jr.	131	134,906	4,429	4,429	2	2	2^C	325
St. Luke's Hospital [1-3]	Bethlehem, Pa.	E. J. Benz	257	164,635	5,248	5,248	2	2	4^P	225
Bryn Mawr Hospital [1-3]	Bryn Mawr, Pa.	M. M. Strumia	217	261,183	4,644	4,207	1	4	4^P	200
Chester Hospital [1]	Chester, Pa.	G. B. Sickel	186	137,687	2,783	2,783	2	3	2^C	350
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	T. K. Hepler	150	260,826	3,383	3,305	1	3	4^P	175
Thomas M. Fitzgerald-Mercy Hospital	Darby, Pa.	W. H. Miller	155	118,914	2,797	2,797	2	8	4^P	200
[illegible] [1-3]	Erie, Pa.	E. L. Armstrong	222	341,260	7,235	6,798	1	4	4^P	250
[illegible] [1-3]	Erie, Pa.	R. B. Eisenberg	171	170,950	4,676	4,651	1	4	4^P	250
[illegible] [1-3]	Harrisburg, Pa.	F. W. Brason	345	351,379	17,858	17,808	1	4	4^P	250
Harrisburg Polyclinic Hospital	Harrisburg, Pa.	J. S. Forrester	247	257,318	7,225	5,893	1	1	2^A	250
Conemaugh Valley Memorial Hospital [1-3]	Johnstown, Pa.	W. W. Ayres	165	217,012	6,611	5,425	2	8	4^P	300
Lancaster General Hospital [1-3]	Lancaster, Pa.	W. M. O'Donnell	212	168,927	4,380	4,380	2	4	2^A	200
St. Joseph's Hospital [1]	Lancaster, Pa.	H. Shaub	147	124,708	4,923	4,822	1	2	2^C	300
Montgomery Hospital	Norristown, Pa.	H. T. Tamaki	125	85,000	2,100	2,100	1	2	2^P	250
Albert Einstein Medical Center										
Northern Division	Philadelphia	H. Brody	315	238,654	5,643	5,643	2	6	4^P	125
Southern Division [1-3]	Philadelphia	D. Meranze	154	190,389	5,292	5,292	2	4	4^P	125
Episcopal Hospital [1-3]	Philadelphia	A. D. Wallis	167	166,370	2,527	2,527	1	1	4^P	150
Frankford Hospital [1-3]	Philadelphia	L. Rauer	167	141,795	3,370	3,379	1	3	3^P	250
Germantown Dispensary and Hospital [1-3]	Philadelphia	F. Fite	180	118,439	4,572	4,572	1	4	4^P	175
[illegible] Hospital of the University [illegible]	Philadelphia	A. Valdes-Dapena	148	182,311	3,690	3,690	2	3	2^C	100
[illegible] ge and Hospital [1-3]	Philadelphia	J. E. Imbriglia	310	268,556	6,000	6,000	2	6	4^P	75
[illegible] of Pennsylvania [1-3]	Philadelphia	H. T. Enterline-R. Norris	378	479,725	8,759	8,759	3	12	4^P	150
Hospital of the Woman's Medical College of Pennsylvania [1-3]	Philadelphia	I. N. Dublin	141	91,761	2,143	2,135	1	[illegible]	4^P	110
Jefferson Medical College Hospital [1-3]	Philadelphia	P. A. Herbut	357	296,713	7,862	7,862	2	8	4^P	150
Lankenau Hospital [1-3]	Philadelphia	C. E. Brown	239	189,333	4,889	4,889	1	4	4^P	200
Misericordia Hospital [1]	Philadelphia	H. E. Marx	180	145,056	4,404	4,404	1	2	2^P	250
Pennsylvania Hospital [1-3]	Philadelphia	A. R. Crane	270	341,632	6,432	6,432	4	4	4^P	100
Philadelphia General Hospital [1-3]	Philadelphia	W. Ehrich	1,263	734,490	6,080	6,080	3	7	4^P	121
Presbyterian Hospital [1-3]	Philadelphia	R. P. Custer	234	169,311	4,773	4,373	2	8	4^P	175
Temple University Hospital [1-3]	Philadelphia	E. E. Aegerter	313	555,648	8,000	8,000	4	12	4^P	...
Veterans Admin. Hospital [1-3]	Philadelphia	S. Bornstein	287	309,773	1,948	1,948	3	3	3^A	...
Allegheny General Hospital [1]	Pittsburgh	R. C. Grauer	277	206,728	4,654	4,654	1	4	4^P	300
Health Center Hospitals of the University of Pittsburgh School of Medicine										
Children's Hospital [1-3]	Pittsburgh	G. H. Fetterman	193	109,178	1,509	1,509	2	3	1^P	125

Numerical and other references will be found on pages 640 through 642.

16. PATHOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
Elizabeth Steel Magee Hospital [1-3]	Pittsburgh	J. C. Henthorne	212	103,429	4,911	4,911	1	1	2^{p}	125
Presbyterian Hospital [1-3]	Pittsburgh	T. Moran	648	423,070	12,174	12,174	5	11	4^{p}	125
Mercy Hospital [1-3]	Pittsburgh	M. M. Bracken	190	331,385	8,837	7,070	1	4	4^{p}	235
Montefiore Hospital [1-3]	Pittsburgh	K. Y. Yardumian	154	151,141	6,125	4,661	1	3	4^{p}	225
St. Francis General Hospital and Rehabilitation Institute [1-3]	Pittsburgh	R. C. Hamilton	225	217,442	3,686	3,669	1	4	4^{p}	225
St. Margaret Memorial Hospital [1-3]	Pittsburgh	J. E. Kurtz	66	87,048	2,142	2,142	1	1	1^{p}	300
Shadyside Hospital [1-3]	Pittsburgh	E. L. Heller	200	117,415	3,961	2,641	1	4	4^{p}	400
South Side Hospital [1-3]	Pittsburgh	L. Goodman	163	136,505	2,592	2,582	1	2	2^{a}	350
Veterans Admin. Hospital [1-3]	Pittsburgh	E. R. Fisher	426	328,863	2,986	2,986	2	8	4^{p}	...
Western Pennsylvania Hospital [3]	Pittsburgh	R. G. McManus	263	218,496	7,688	6,245	2	8	4^{p}	225
Community General Hospital [1-3]	Reading, Pa.	H. S. Cook	127	79,732	3,096	2,971	2	2	2^{p}	300
Reading Hospital [1-3]	Reading, Pa.	W. P. Jennings	297	182,936	3,816	3,816	2	8	4^{p}	225
St. Joseph's Hospital [1-3]	Reading, Pa.	G. Desjardins	148	156,665	16,120	5,840	1	2	2^{a}	...
Robert Packer Hospital [1-3]	Sayre, Pa.	C. H. De Wan	159	206,221	4,231	3,459	1	3	4^{p}	225
Scranton State Hospital [1-3]	Scranton, Pa.	J. J. O'Connor, Jr.	117	102,239	1,812	1,494	1	1	1^{a}	533
Wilkes-Barre General Hospital [1-3]	Wilkes-Barre, Pa.	C. E. Rodriguez	101	125,409	3,450	3,019	1	1	2^{a}	225
Williamsport Hospital [1-3]	Williamsport, Pa.	M. G. Colvin	126	149,643	5,346	4,774	..	1	4^{p}	225
York Hospital [3]	York, Pa.	J. M. Smith	233	168,531	7,040	7,040	1	2	4^{p}	300
Newport Hospital [1-3]	Newport, R. I.	W. Freeman-R. M. Webster	93	112,662	4,475	3,281	1	1	1^{a}	150
Memorial Hospital [1-3]	Pawtucket, R. I.	G. P. Paparo	129	132,185	3,637	2,874	1	4	4^{p}	...
Rhode Island Hospital [1-3]	Providence, R. I.	H. Fanger	340	367,119	11,338	11,338	2	8	4^{p}	125
Teaching Hospitals of the Medical College of South Carolina	Charleston, S. C.	K. M. Lynch	504	284,478	28,465	24,594	4	16	4^{p}	137
Medical College Hospital		...	...	...	...	...	..	..	..	...
Roper Hospital		...	...	...	...	...	..	..	..	...
Greenville General Hospital [1]	Greenville, S. C.	E. A. Dreskin	251	213,154	14,205	6,772	1	3	4^{p}	250
Spartanburg General Hospital [1]	Spartanburg, S. C.	J. R. Cain	221	208,085	7,498	7,498	1	1	4^{p}	200
Baroness Erlanger Hospital [1-3]	Chattanooga, Tenn.	J. W. Adams	449	295,344	17,041	17,041	1	4	4^{p}	250
East Tennessee Baptist Hospital [1-3]	Knoxville, Tenn.	R. J. Leffler	132	113,810	5,621	5,059	1	2	2^{p}	300
St. Mary's Memorial Hospital [1-3]	Knoxville, Tenn.	G. Mabon	128	126,586	5,704	3,735	2	4	3^{p}	250
University of Tennessee Memorial Research Center and Hospital [1-3]	Knoxville, Tenn.	F. S. Jones	124	116,010	1,966	1,543	1	2	3^{p}	320
Baptist Memorial Hospital [1-3]	Memphis, Tenn.	M. L. Trumbull	306	279,355	14,210	12,496	2	8	4^{p}	310
City of Memphis Hospitals [1-3]	Memphis, Tenn.	D. H. Sprunt	636	99,654	6,269	6,269	6	18	4^{p}	150
Methodist Hospital	Memphis, Tenn.	W. W. Tribby	101	164,821	8,667	7,741	1	3	3^{p}	220
St. Joseph Hospital [1-3]	Memphis, Tenn.	L. Prieto	129	131,279	4,785	4,785	1	2	2^{a}	250
Veterans Admin. Hospital [1-3]	Memphis, Tenn.	J. M. Young	356	349,719	4,931	4,397	1	2	3^{p}	...
Baptist Hospital [1-3]	Nashville, Tenn.	F. Womack	90	175,271	6,787	4,658	1	2	2^{a}	300
George W. Hubbard Hospital [1-3]	Nashville, Tenn.	J. R. Cuff	166	2,067	2,080	2,080	2	4	2^{a}	150
[illegible] [1-3]	Nashville, Tenn	W. A. De Monbreun	91	143,458	7,769	7,602	1	2	2^{p}	175
[illegible]spital [1-3]	Nashville, Tenn.	J. L. Shapiro	252	198,610	3,204	3,140	2	5	4^{p}	50
[illegible] clear Studies [1-3-32]	Oak Ridge, Tenn	C. H. Steffee	27	19,204	862	862	..	2	1^{a}	167
Brackenridge Hospital [1-3]	Austin, Texas	J. R. Rainey, Jr.	137	75,456	2,886	2,442	1	1	2^{a}	200
Baylor University Hospital [1-3]	Dallas, Texas	J. M. Hill	288	348,230	13,298	12,856	3	9	4^{p}	175
Methodist Hospital [1-3]	Dallas, Texas	A. B. Cairns	99	72,370	6,529	4,339	1	3	2^{p}	275
Parkland Memorial Hospital [1-3]	Dallas, Texas	C. Ashworth	372	651,398	6,111	6,111	2	6	4^{p}	150
St. Paul's Hospital [1-3]	Dallas, Texas	J. L. Goforth	270	240,873	14,949	11,654	2	8	4^{p}	150
Harris Hospital [1]	Fort Worth, Texas	C. D. Fitzwilliams-R. C. Schaffer	179	221,795	8,989	8,076	1	4	4^{p}	300
St. Joseph's Hospital [1]	Fort Worth, Texas	O. J. Wollenman, Jr.	201	169,357	5,413	3,960	1	4	4^{p}	300
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	H. Hopps	386	277,415	6,000	5,896	2	8	4^{p}	160
Baylor University College of Medicine Affiliated Hospitals										
Jefferson Davis Hospital [1-3]	Houston, Texas	S. A. Wallace	510	411,845	4,685	4,625	2	9	4^{p}	75
Methodist Hospital [1-3]	Houston, Texas	J. P. Abbott	223	434,631	13,011	7,281	1	4	4^{p}	220
Texas Children's Hospital [1-3]	Houston, Texas	H. Rosenberg	108	166,486	2,167	1,097	1	1	1^{a}	200
Veterans Admin. Hospital [1-3]	Houston, Texas	B. Halpert	397	426,686	2,839	2,689	2	5	4^{p}	...
Hermann Hospital [1-3]	Houston, Texas	W. G. Brown	254	455,147	13,557	13,442	1	4	4^{p}	125
Memorial Hospital [1-3]	Houston, Texas	F. Leidler	155	162,581	7,877	7,697	1	3	3^{p}	220
St. Joseph's Hospital [1-3]	Houston, Texas	P. M. Marcuse	160	247,968	6,888	5,875	1	2	4^{p}	220
University of Texas M. D. Anderson Hospital and Tumor Institute [1-3]	Houston, Texas	W. O. Russell	295	226,304	7,017	7,017	1	14	4^{p}	150
Veterans Admin. Hospital [1-3]	McKinney, Texas	R. D. Reed	102	141,890	1,574	1,574	1	1	4^{p}	...
Baptist Memorial Hospital [1-3]	San Antonio, Texas	A. O. Severance	182	220,544	5,273	4,958	1	4	4^{p}	150
Robert B. Green Memorial Hospital [1-2]	San Antonio, Texas	D. L. Galindo	385	218,159	3,061	3,061	2	4	3^{p}	150
Santa Rosa Hospital [1-2]	San Antonio, Texas	N. H. Jacob	265	211,033	6,066	4,976	1	4	4^{p}	250
Scott and White Memorial Hospitals [1-2]	Temple, Texas	W. N. Powell-J. C. Stinson	85	256,573	8,360	7,929	1	3	3^{p}	300
St. Benedict's Hospital [1-3]	Ogden, Utah	R. C. Ellis	87	120,092	4,258	2,388	1	1	1^{p}	250
Thomas D. Dee Memorial Hospital [1]	Ogden, Utah	W. A. Bennett	197	127,036	5,877	4,487	1	2	2^{p}	325
Dr. W. H. Groves Latter-Day Saints Hospital [1-3]	Salt Lake City	J. Carlquist	244	250,648	7,548	5,422	1	4	4^{p}	250
Holy Cross Hospital [1-3]	Salt Lake City	C. McNeil	107	123,111	5,565	3,670	1	2	2^{p}	175
Salt Lake County General Hospital [3]	Salt Lake City	W. Carnes	225	83,510	1,670	1,640	2	4	3^{a}	220
Veterans Admin. Hospital [1-3]	Salt Lake City	T. H. Cochran	90	84,355	999	787	1	2	1^{a}	...
University of Vermont Affiliated Hospitals		...	...	...	...	...	..	..	4^{p}	...
De Goesbriand Memorial Hospital	Burlington, Vt.	E. Stark	106	56,570	1,932	1,932	1	4	..	167
Mary Fletcher Hospital [1-3]	Burlington, Vt.	R. Coon	227	87,779	3,753	3,409	2	8	..	100
University of Virginia Hospital [1-3]	Charlottesville, Va.	J. R. Cash-O. B. Bobbitt	381	280,000	13,549	13,549	3	7	4^{p}	200
Memorial Hospital [1-3]	Danville, Va.	J. W. Hooker	129	107,473	6,248	6,248	1	4	4^{p}	...
Lynchburg General Hospital [1-3]	Lynchburg, Va.	M. Bouton	86	55,024	2,221	2,221	..	2	2^{p}	200
Riverside Hospital [1-3]	Newport News, Va.	M. F. Sherrill	75	59,210	3,194	3,194	1	1	1^{a}	250
De Paul Hospital [1-3]	Norfolk, Va.	A. F. Strauss	225	221,214	7,903	7,460	2	4	4^{p}	200
Norfolk General Hospital [1-3]	Norfolk, Va.	J. J. Marra-E. D. Levy	209	175,894	8,038	7,775	1	4	4^{p}	290
Johnston-Willis Hospital [1-3]	Richmond, Va.	J. L. Thornton	132	72,164	2,927	2,927	1	1	1^{a}	250
Medical College of Virginia-Hospital Division [1-3]	Richmond, Va.	F. L. Apperly-H. G. Kupfer	643	572,907	9,943	9,057	1	9	4^{p}	75

Numerical and other references will be found on pages 640 through 642.

16. PATHOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of Autopsies	Total Number of Laboratory Examinations	Number of Surgical Specimens	Number Examined Microscopically	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Programs (Years)	Beginning Stipend (Month)
Richmond Memorial Hospital [1]	Richmond, Va.	W. M. Monroe	58	113,521	3,084	3,084	..	..	3^p	300
Veterans Admin. Hospital [1-3]	Richmond, Va.	J. R. Kriz	228	220,735	2,535	2,260	1	2	4^p	...
Doctors Hospital [1-3]	Seattle	G. W. Tooley	165	111,284	6,889	4,959	1	2	2^a	250
Providence Hospital [1-3]	Seattle	D. G. Mason	203	132,554	6,790	4,496	2	2	2^a	215
Swedish Hospital [1-3]	Seattle	P. K. Lund	260	189,478	10,320	10,044	1	4	4^p	225
University of Washington Affiliated Hospitals										
King County Hospital Unit No. 1 (Harborview) [1]	Seattle	I. I. Schuldberg	726	206,538	3,747	3,352	1	4	4^p	125
Veterans Admin. Hospital [1-3]	Seattle	D. V. Brown	243	83,279	1,586	1,502	1	4	3^p	...
Virginia Mason Hospital [1-3]	Seattle	H. W. Jones	221	222,305	9,958	8,645	1	1	4^p	150
Deaconess Hospital [1-3]	Spokane, Wash.	T. E. Ludden	216	127,257	4,464	3,278	1	1	3^a	300
Sacred Heart Hospital [3]	Spokane, Wash.	J. Hill-J. D. MacCarthy	267	181,784	8,063	7,929	2	6	3^a	250
St. Luke's Hospital	Spokane, Wash.	O. O. Christianson	117	142,015	3,344	2,149	1	1	2^p	225
St. Joseph Hospital [1]	Tacoma, Wash.	C. R. McColl	106	101,869	4,901	4,541	2	4	2^a	300
Tacoma General Hospital [1-3]	Tacoma, Wash.	C. P. Larson	149	86,101	11,146	9,765	1	4	4^p	250
Beckley Memorial Hospital [1]	Beckley, W. Va.	W. A. Laqueur	96	96,164	2,400	2,300	1	1	1^a	300
Charleston General Hospital [1-3]	Charleston, W. Va.	W. Putschar	102	82,873	2,986	2,949	1	3	3^p	225
Memorial Hospital [1-3]	Charleston, W. Va.	G. B. Swoyer	135	114,097	3,859	3,859	1	2	2^p	250
St. Mary's Hospital [1-3]	Clarksburg, W. Va.	H. Fischer	64	108,258	3,033	1,940	1	1	2^p	300
Cabell Huntington Hospital [1-3]	Huntington, W. Va.	S. Werthammer-J. E. Sadka	70	59,904	3,505	3,140	1	3	3^a	250
St. Mary's Hospital [1-3]	Huntington, W. Va.	S. Werthammer	112	239,592	5,318	4,683	..	..	3^a	275
Veterans Admin. Hospital [1-3]	Martinsburg, W. Va.	R. G. Gottschalk	139	226,473	1,435	1,130	1	1	2^p	...
Ohio Valley General Hospital [1-3]	Wheeling, W. Va.	H. G. Little	153	116,118	5,166	4,438	1	4	4^p	300
St. Agnes Hospital [1]	Fondulac, Wis.	R. W. Steube	115	140,305	5,558	2,752	1	2	2^a	200
Madison General Hospital [1-3]	Madison, Wis.	P. G. Piper	173	131,956	6,847	6,397	1	2	4^p	175
University Hospitals [1-3]	Madison, Wis.	W. D. Stovall-D. M. Angevine	358	222,042	5,531	5,474	2	5	4^p	100
Columbia Hospital [1-37p]	Milwaukee	G. Ritchie	152	95,262	4,141	2,796	1	4	4^p	245
Evangelical Deaconess Hospital [1-3]	Milwaukee	R. S. Haukohl	174	86,272	4,734	3,692	1	3	4^p	300
Milwaukee County Hospital [1-3]	Milwaukee	P. Kimmelstiel	672	348,751	3,226	3,226	2	8	4^p	207
Milwaukee Hospital [1-3]	Milwaukee	E. A. Birge	185	172,478	6,482	5,556	1	2	4^p	270
St. Joseph's Hospital [1-3]	Milwaukee	C. H. Altshuler	177	186,711	6,595	5,396	1	4	4^p	280
St. Luke's Hospital [1-3]	Milwaukee	B. E. Clarke	146	125,482	2,840	2,006	1	4	4^p	275
St. Mary's Hospital [1-3-36p]	Milwaukee	S. B. Pessin	152	107,480	5,580	3,754	1	4	4^p	300
Veterans Admin. Hospital [1-3]	Milwaukee (Wood), Wis.	R. M. Maynard	454	306,167	2,619	2,427	2	6	4^p	...
Gorgas Hospital [1]	Ancon, C. Z.	H. Mondragon	232	317,012	2,532	2,532	1	4	4^p	345
Queen's Hospital [1-3]	Honolulu, T. H.	W. H. Civin	237	181,511	6,563	6,237	1	4	4^p	150
St. Francis Hospital [1-3]	Honolulu, T. H.	R. Chappell	96	153,238	14,019	8,139	1	2	2^a	150
Aguadilla District Hospital	Aguadilla, P. R.	D. A. Jutzy	211	61,548	1,458	.....	1	1	1^a	250
Arecibo District Hospital	Arecibo, P. R.	M. A. de J. Gonzales	195	114,707	892	892	..	..	1^a	250
Bayamon Charity District Hospital [1-3]	Bayamon, P. R.	R. R. Weiser	313	113,512	3,233	3,233	1	4	4^p	250
San Juan City Hospital [1-3]	San Juan, P. R.	E. Koppisch	377	265,784	2,542	2,514	2	5	3^a	150
Veterans Admin. Hospital	San Juan, P. R.	F. M. Reyes	62	83,712	2,331	2,331	1	2	1^a	...
Dr. I. Gonzales Oncologic Hospital [14]	Santurce, P. R.	R. A. Marcial-Kovas	25	12,000	4,177	3,937	1	2	1^a	300

17. PEDIATRIC ALLERGY

Residency programs in the following hospitals have been approved for TWO years of training by the Council, the American Academy of Pediatrics, the American Board of Pediatrics and the Sub-Specialty Board of Pediatric Allergy, through the Residency Review Committee for Pediatrics. [illegible] to qualify for examination by the Sub-Specialty Board of Pediatric Allergy of the American Board of Pediatrics, should refer to the Board Requirements on Page 678, [illegible] "Mixed," "Adult" and "Pediatric" categories below.)

Hospitals, 15.

Name of Hospital	Location	Chief of Service
University of California Hospital	Los Angeles	E. M. Heimlich
University of California Hospital	San Francisco	W. C. Deamer-T. L. Nelson
University of Colorado Medical Center		M. F. Smelzer
Colorado General Hospital	Denver	
Denver General Hospital	Denver	
Children's Hospital	Washington, D. C.	R. H. Todd
Michael Reese Hospital	Chicago	M. M. Mosko-A. Matheson
Children's Medical Center	Boston	H. L. Mueller
*Mayo Foundation	Rochester, Minn.	G. B. Logan
*Children's Hospital	Buffalo	V. L. Cohen
*Roosevelt Hospital	New York City	R. A. Cooke
*Strong Memorial—*Rochester* Municipal Hospitals	Rochester, N. Y.	J. Glaser
Duke Hospital	Durham, N. C.	S. C. Dees
*Rhode Island Hospital	Providence, R. I.	S. S. Freedman
Children's Medical Center	Dallas, Texas	S. Halpern
*University Hospitals	Madison, Wis.	S. B. Crepea

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* The total residency programs in Allergy at these centers also include Adult Allergy. Accordingly, residency programs in centers with the symbol (*) are in the "Mixed" category referred to under Board Requirements on page 680. Reference should also be made to the listing of hospitals approved in Allergy on page 561. Residency programs in these hospitals are in the "Adult" category referred to under Board Requirements on page 680. All other residency programs listed above under Pediatric Allergy, are in the "Pediatric" category referred to on page 607.

18. PEDIATRICS

Residency programs in the following hospitals have been approved by the Council, the American Academy of Pediatrics and the American Board of Pediatrics, through the Residency Review Committee for Pediatrics, as offering full training in the specialty: (i. e., TWO or more years).

Hospitals, 254; Assistant Residencies and Residencies, 1,779

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered*	Total Residencies Offered*	Beginning Stipend (Month)
UNITED STATES AIR FORCE							
U. S. Air Force Hospital	San Antonio, Texas	J. P. Hough	899	11	2	4	...
UNITED STATES ARMY							
Letterman Army Hospital [1-3]	San Francisco	F. Biehusen	639	22	3	6	...
Fitzsimons Army Hospital [1-3]	Denver	H. J. Umlauf, Jr.	647	45	2	4	...
Army Medical Center [1-3]	Washington, D. C.	L. J. Geppert	1,692	45	3	6	...
William Beaumont Army Hospital [3]	El Paso, Texas	T. W. Cap	3,542	45	2	4	...
Brooke Army Hospital [1-3]	San Antonio, Texas	....	2,946	22	3	6	...
Madigan Army Hospital [1-3]	Tacoma, Wash.	E. J. Tomsovic	769	9	2	4	...
Tripler Army Hospital [1-3]	Honolulu, T. H.	J. P. Fairchild	1,177	18	3	6	...
UNITED STATES NAVY							
U. S. Naval Hospital [1-3]	Oakland, Calif.	M. Kurzrok	1,662	16	3	5	...
U. S. Naval Hospital [1]	San Diego, Calif.	E. R. Moeller	1,337	25	3	4	...
U. S. Naval Hospital [1-3]	Bethesda, Md.	T. E. Cone, Jr.	1,143	..	3	6	...
U. S. Naval Hospital [1-3]	Chelsea, Mass.	A. M. Margileth	802	43	2	4	...
U. S. Naval Hospital [1-3]	Philadelphia	W. I. Neikirk	402	7	3	4	...
U. S. Naval Hospital [1-3]	Portsmouth, Va.	E. M. Leach	1,341	32	1	2	...
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE							
Freedmen's Hospital [1-3]	Washington, D. C.	R. B. Scott	673	6	1	5	308
NONFEDERAL							
University of Alabama Medical Center							
Children's Hospital [1-3]	Birmingham, Ala.	C. L. Lamar	3,156	31	2	3	143
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	K. Hare	3,461	86	6	12	108
Lloyd Noland Hospital [1-3]	Fairfield, Ala.	G. C. McCullough	1,519	3	2	4	250
Mobile County Hospital [1-3]	Mobile, Ala.	J. H. Baumhauer	1,448	23	1	2	275
Maricopa County General Hospital [1-3]	Phoenix, Ariz.	C. A. Holmes	953	39	..	1	300
St. Joseph's Hospital [1-3]	Phoenix, Ariz.	J. Kaye	1,283	21	1	2	250
University Hospital [1-3]	Little Rock, Ark.	T. C. Panos	830	51	4	7	155
Kern County General Hospital [1]	Bakersfield, Calif.	J. Thorner	908	21	2	4	325
San Joaquin General Hospital [1]	French Camp, Calif.	W. T. Auld	756	19	1	2	260
General Hospital of Fresno County [1-3-51]	Fresno, Calif.	J. P. Conrad	1,054	22	2	4	300
California Babies' and Children's Hospital [1-3]	Los Angeles	T. L. Birnberg	1,274	..	1	2	200
Cedars of Lebanon Hospital [1-3]	Los Angeles	B. Kagan	1,738	19	2	8	265
Children's Hospital [1]	Los Angeles	R. Ward	8,300	250	11	24	150
Los Angeles County Hospital [1]	Los Angeles	R. F. Chinnock	4,569	85	7	14	246
Queen of Angels Hospital [1-3]	Los Angeles	C. Mouton	1,312	4	1	2	200
University of California Hospital [1-3]	Los Angeles	J. M. Adams	1,526	65	3	9	229
White Memorial Hospital [1-3]	Los Angeles	R. F. Chinnock	701	15	2	4	215
Children's Hospital of the East Bay [1]	Oakland, Calif.	H. Long	7,418	73	6	12	225
Highland-Alameda County Hospital [1-3]	Oakland, Calif.	M. H. Schwartz	1,501	31	2	3	200
Kaiser Foundation Hospital [1-3]	Oakland, Calif.	A. K[illegible]r	771	9	4	6	315
Children's Hospital [1-3]	San Francisco	E. B. Shaw	964	15	2	4	175
Department of Contagious Diseases		E. B. Shaw	426	5	..	..	175
Kaiser Foundation Hospital [1-3]	San Francisco	J. G. Smille	662	7	2	4	200
St. Luke's Hospital [1-3]	San Francisco	L. Hardgrave	622	5	1	2	325
St. Mary's Hospital [1-3]	San Francisco	R. Flood	2,227	6	1	2	200
Stanford University Hospitals							
San Francisco Hospital [1]	San Francisco	E. H. Senz	830	3	3	3	205
University Hospital [1-3]	San Francisco	R. Gross	452	47	3	7	100
University of California Hospitals							
San Francisco Hospital [1]	San Francisco	H. B. Bruyn	779	2	2	2	205
University Hospital [3]	San Francisco	W. C. Deamer	803	55	4	9	231
Santa Clara County Hospital [1-3]	San Jose, Calif.	R. D. Cutter	401	13	1	2	260
Harbor General Hospital [1]	Torrance, Calif.	A. J. Moss	1,359	27	3	6	246
Children's Hospital [1-3]	Denver	R. O. Sherberg	4,897	86	6	10	200
University of Colorado Medical Center							
Colorado General Hospital [1-3]	Denver	C. H. Kempe	506	52	8	22	180
Denver General Hospital [1-3]	Denver	C. H. Kempe	908	12	..	..	179
Hartford Hospital [1-3]	Hartford, Conn.	J. B. Griggs	901	14	1	2	125
St. Francis Hosp[illegible]	Hartford, Conn.	T. F. Murphy	849	8	2	3	175
Grace-New Haven [illegible]	[illegible] Conn.	N. K. Ordway-W. R. Wilson	967	60	5	9	140
Hospital of St. [illegible]	[illegible] Conn.	P. F. McAlenney	2,040	34	2	3	150
Delaware Hospita[illegible]	[illegible] Del.	R. O. Y. Warren	2,319	40	2	4	220
Children's Hospital [1-3]	Washington, D. C.	R. H. Parrott	3,339	55	14	24	100
District of Columbia General Hospital [1-3]	Washington, D. C.	L. Hoeck	2,196	48	5	10	233
Georgetown University Hospital [1-3]	Washington, D. C.	F. G. Burke	1,361	31	4	7	175
Duval Medical Center [1-3]	Jacksonville, Fla.	J. K. David, Jr.	657	25	2	4	150
St. Vincent's Hospital [3]	Jacksonville, Fla.	H. Carithers	2,123	13	1	2	300
Jackson Memorial Hospital [1-3]	Miami, Fla.	R. B. Lawson	1,886	58	5	11	75
Crawford W. Long Memorial Hospital [1-3]	Atlanta, Ga.	J. H. Patterson	1,431	62	5	6	285
Georgia Baptist Hospital [1]	Atlanta, Ga.	J. Yampolsky	3,379	73	3	5	305
Grady Memorial Hospital [1]	Atlanta, Ga.	R. W. Blumberg	961	38	4	10	100
St. Joseph's Infirmary [1-3]	Atlanta, Ga.	C. D. Fowler	1,499	13	1	2	270
Medical College of Georgia Hospitals							
Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga.	V. Vaughan	214	30	4	9	250
University Hospital [1]	Augusta, Ga.	P. Ellington	4,354	58	1	3	200
Children's Memorial Hospital [1-3]	Chicago	J. A. Bigler	2,668	70	12	16	75
Cook County Hospital	Chicago	H. N. Sanford	8,074	548	8	17	140
Department of Contagious Diseases		A. L. Hoyne	1,095	19	..	1	140
Loyola University (Stritch School of Medicine) Affiliated Hospitals							
Mercy Hospital [1-3-38]	Chicago	W. H. Elghammer	1,493	11	4	9	200

Numerical and other references will be found on pages 640 through 642.

18. PEDIATRICS—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
Michael Reese Hospital [1-3]	Chicago	J. Metcoff	4,548	151	7	14	125
Mount Sinai Hospital [1-3]	Chicago	I. M. Levin	868	36	2	3	225
Presbyterian-St Luke's Hospital							
Presbyterian Hospital Division [1-3]	Chicago	F. C. Moll	1,435	25	1	2	125
St. Luke's Hospital Division [1-3]	Chicago	A. D. Biggs	520	10	1	2	125
Provident Hospital [1-3]	Chicago	C. J. Runner	849	14	1	2	200
University of Chicago Clinics [1-3]	Chicago	F. H. Wright	1,298	57	6	13	200
University of Illinois Research and Educational Hospitals [1-3]	Chicago	H. N. Sanford	1,325	60	4	7	140
St. Francis Hospital [1]	Evanston, Ill.	J. B. Murphy	1,024	22	1	2	210
Little Company of Mary Hospital [1-3]	Evergreen Park, Ill.	E. G. Lawler	4,076	12	2	4	175
Indiana University Medical Center		....	....	..	5	11	...
Indianapolis General Hospital [1-3]	Indianapolis	H. F. Call	5,300	72	..	..	205
Indiana University Medical Center Hospital [1]	Indianapolis	L. T. Meiks	1,786	89	..	..	165
Riley Hospital	Indianapolis	....	....	..	..	..	...
Methodist Hospital [1]	Indianapolis	P. Hedrick	2,402	17	1	2	278
St. Vincent's Hospital [1-3]	Indianapolis	H. E. Stadler	2,730	10	1	2	275
Iowa Methodist Hospital (Raymond Blank Memorial Hospital for Children) [1-3-142]	Des Moines, Iowa	L. F. Hill	4,901	72	4	8	200
State University of Iowa Hospitals [1-3]	Iowa City	W. W. McCrory	1,791	65	4	10	175
University of Kansas Medical Center [1-3]	Kansas City, Kan.	H. Miller	1,189	52	4	8	125
St. Joseph Infirmary [1-3]	Louisville, Ky.	M. Limper	3,275	23	2	4	210
University of Louisville Medical Center		....	7,800	111	15	30	83
Children's Hospital	Louisville, Ky.	J. A. Little	.....	...	..	..	...
Louisville General Hospital [1-3]	Louisville, Ky.	A. J. Steigman	.....	...	..	..	...
Charity Hospital of Louisiana							
Louisiana State University Unit [1]	New Orleans	R. L. Fowler	2,423	54	9	17	100
Tulane University Unit [1]	New Orleans	R. V. Platou	2,299	45	9	17	100
Confederate Memorial Medical Center [1]	Shreveport, La.	C. H. Webb	3,263	50	2	4	125
Baltimore City Hospitals [1-3]	Baltimore	H. E. Harrison	1,423	166	3	9	75
Johns Hopkins Hospital [1-3]	Baltimore	R. E. Cooke	1,955	166	12	32	160
Sinai Hospital [1-3]	Baltimore	H. H. Gordon	938	27	3	7	110
Union Memorial Hospital [1-3]	Baltimore	T. T. Burger	632	12	2	3	215
University Hospital [1]	Baltimore	J. E. Bradley	813	41	3	7	75
Boston City Hospital [1-3]	Boston	S. S. Gellis	1,823	95	12	23	132
Boston Floating Hospital [1-3]	Boston	J. M. Baty	2,602	78	4	8	100
Children's Medical Center	Boston	C. A. Janeway	1,492	125	5	35	...
Massachusetts General Hospital [1-3]	Boston	A. M. Butler	1,071	...	5	12	67
St. Vincent's Hospital	Worcester, Mass.	P. Karpawich	2,983	16	1	2	175
Worcester City Hospital [1-3]	Worcester, Mass.	R. Cox	1,136	12	1	2	215
University Hospital [1-3]	Ann Arbor, Mich.	J. L. Wilson	1,574	75	8	24	160
Children's Hospital	Detroit	P. V. Woolley, Jr.	7,047	252	12	27	150
Harper Hospital [1-3]	Detroit	E. E. Martmer	1,475	17	1	8	275
Henry Ford Hospital [1-3]	Detroit	J. A. Johnston	1,307	11	4	8	250
Hurley Hospital [1-3]	Flint, Mich.	E. M. Eichhorn	3,790	35	1	2	325
Butterworth Hospital [1-3]	Grand Rapids, Mich.	M. Dick	1,233	34	1	2	300
St. Joseph Mercy Hospital [1-3]	Pontiac, Mich.	F. M. Adams	4,113	17	1	2	325
Saginaw General Hospital [1-3]	Saginaw, Mich.	R. M. Heavenrich	1,731	10	1	2	365
Minneapolis General Hospital	Minneapolis	R. B. Raile	2,109	20	3	4	220
Northwestern Hospital [1-3]	Minneapolis	N. Beach	1,476	42	1	2	200
University of Minnesota Hospitals [1-3]	Minneapolis	J. Anderson	2,506	155	8	16	209
Mayo Foundation	Rochester, Minn.	J. W. DuShane	3,312	99	6	18	175
University Hospital [1]	Jackson, Miss.	B. Batson	575	27	2	5	250
University of Missouri Medical Center [1-3]	Columbia, Mo.	R. L. Jackson	526	14	2	5	200
Children's Mercy Hospital [1-3]	Kansas City, Mo.	W. Hart	1,391	34	3	9	175
Kansas City General Hospital No. 1 [1-3-210]	Kansas City, Mo.	G. E. Hughes	541	2	1	2	200
Homer G. Phillips Hospital [1-3]	St. Louis	P. J. White	2,747	35	8	15	201
St. Louis Children's Hospital [1-3]	St. Louis	A. F. Hartmann	4,083	134	8	32	50
St. Louis City Hospital [1-3-225]	St. Louis	V. Peden	2,308	37	5	11	231
St. Mary's Group of Hospitals [1-3]	St. Louis	J. P. King	3,336	54	4	8	100
Children's Memorial Hospital [1-3]	Omaha, Neb.	J. L. Gedgoud	4,117	58	4	8	275
Creighton Memorial—St. Joseph's Hospital	Omaha, Neb.	J. H. Murphy	3,161	21	2	4	210
Contagious Division of County Hospital		....	.....	...	..	..	...
Omaha Children's Hospital		....	.....	...	..	..	...
Riverview Home		....	.....	...	..	..	...
St. Joseph Orphanage		....	.....	...	..	..	...
University of Nebraska Hospital [1-3-231]	Omaha, Neb.	G. E. Gibbs	583	19	2	5	200
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	C. C. Stewart	950	16	1	2	218
Jersey City Medical Center	Jersey City, N. J.	B. P. Abrams	1,523	8	3	6	108
Fitkin Memorial Hospital [1-3]	Neptune, N. J.	J. F. Raffetto	1,529	24	1	2	200
Newark Beth Israel Hospital [1-3]	Newark, N. J.	A. Heyman	863	50	1	2	100
St. Michael's Hospital [1-3]	Newark, N. J.	H. A. Murray	3,008	27	3	6	165
United Hospitals of Newark							
Babies Hospital—Coit Memorial [1-3]	Newark, N. J.	W. Mitchell	3,877	28	2	5	150
Bernalillo County—Indian Hospital	Albuquerque, N. Mex.	E. L. Adler	914	23	2	3	350
Albany Hospital [1-3]	Albany, N. Y.	P. Patterson	985	...	2	6	160
Beth El Hospital [1-3]	Brooklyn, N. Y.	B. Schick	438	26	3	4	150
Brooklyn Hospital [1-3]	Brooklyn, N. Y.	T. M. Lamb	492	8	2	4	175
Coney Island Hospital [1-3]	Brooklyn, N. Y.	S. Nussbaum	489	37	2	4	105
Cumberland Hospital [1-3]	Brooklyn, N. Y.	J. A. Monfort	1,023	40	2	4	105
Jewish Hospital [1-3]	Brooklyn, N. Y.	J. Pincus	1,495	25	4	10	100
Kings County Hospital Center	Brooklyn, N. Y.	K. G. Jennings- R. L. Day	2,814	73	2	21	105
Long Island College Hospital [1-3]	Brooklyn, N. Y.	C. A. Weymuller	609	6	2	3	136
Lutheran Medical Center [1-3]	Brooklyn, N. Y.	J. A. Monfort	770	27	1	2	160
Maimonides Hospital [1-3]	Brooklyn, N. Y.	B. Kramer	507	12	2	3	75
Methodist Hospital [1-3]	Brooklyn, N. Y.	W. R. Coles	381	17	1	2	175
St. Catherine's Hospital [1-3]	Brooklyn, N. Y.	J. P. Lombard	616	1	2	3	125
St. John's Episcopal Hospital [1-3]	Brooklyn, N. Y.	B. H. Shulman	1,232	22	1	2	175
St. Mary's Hospital [1-3]	Brooklyn, N. Y.	A. G. Stigliano	938	20	1	2	200
Children's Hospital [1-3]	Buffalo	M. I. Rubin	3,499	105	12	22	125
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	T. S. Bumbalo	998	22	2	4	217

Numerical and other references will be found on pages 640 through 642.

18. PEDIATRICS—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
Mary Imogene Bassett Hospital [1-3]	Cooperstown, N. Y.	T. C. Goodwin	333	6	1	2	150
Elmhurst General Hospital [1-3]	Elmhurst, N. Y.	E. E. Amerman	1,568	8	3	5	105
Meadowbrook Hospital [1-3]	Hempstead, N. Y.	E. A. Stanchi	1,724	55	3	6	225
Queens Hospital Center [1-3]	Jamaica, N. Y.	M. Coe	1,502	66	4	7	105
Charles S. Wilson Memorial Hospital [1-3]	Johnson City, N. Y.	A. Coddington	2,512	6	1	2	225
North Shore Hospital [1-3]	Manhasset, N. Y.	A. L. Frotman	356	9	2	3	200
Long Island Jewish Hospital [1-3]	New Hyde Park, N. Y.	S. Karelitz	1,640	6	2	5	75
Bellevue Hospital Center							
Div. III New York University							
College of Medicine	New York City	L. E. Holt, Jr.	1,345	64	9	18	80
Beth Israel Hospital [1-3]	New York City	P. Cohen	267	5	1	2	155
Bronx Hospital [1-3]	New York City	J. H. Lapin	752	3	2	3	100
Bronx Municipal Hospital Center [1-3]	New York City	H. L. Barnett	1,303	28	10	20	125
Fordham Hospital [1-3]	New York City	J. Golomb	697	13	2	3	105
Harlem Hospital [1-3]	New York City	H. J. Cohen	785	19	2	4	105
Lenox Hill Hospital [1-3]	New York City	A. F. Anderson	846	9	1	2	180
Lincoln Hospital [1-3]	New York City	H. Barnett	1,439	74	2	5	105
Morrisania City Hospital [1-3]	New York City	F. Chick	1,024	50	2	4	105
Mount Sinai Hospital [1-3]	New York City	H. L. Hodes	2,455	93	6	11	75
New York Hospital [1-3]	New York City	S. Z. Levine	1,688	127	8	17	164
New York Infirmary [1-3]	New York City	B. Worcester	323	16	1	2	150
New York Medical College—Metropolitan Medical Center							
Flower and Fifth Avenue Hospitals [1-3]	New York City	L. B. Slobody	875	14	2	4	100
Metropolitan Hospital [1-3]	New York City	L. B. Slobody	4,372	91	6	12	105
New York Polyclinic Medical							
School and Hospital [1]	New York City	A. B. Susman	871	3	1	2	125
New York University—Bellevue Medical Center							
University Hospital	New York City	A. DeSanctis	1,878	21	4	5	105
Presbyterian Hospital [1]	New York City	R. McIntosh	5,022	190	8	19	250
Roosevelt Hospital [1]	New York City	E. N. Joyner, III	500	2	4	5	133
St. Clare's Hospital [1-3]	New York City	C. H. O'Regan	547	22	2	3	200
St. Luke's Hospital [1-3]	New York City	J. F. Eagle	1,552	9	3	6	100
St. Vincent's Hospital [1-3]	New York City	A. J. Vignec	3,942	74	4	6	125
Genesee Hospital [1-3]	Rochester, N. Y.	J. Glaser	1,703	45	1	2	175
Rochester General Hospital [1-3-249]	Rochester, N. Y.	E. H. Townsend, Jr.	672	16	2	4	125
St. Mary's Hospital [1-3]	Rochester, N. Y.	R. Sommers	1,241	6	1	2	230
Strong Memorial—Rochester							
Municipal Hospital [1-3-293]	Rochester, N. Y.	W. L. Bradford	1,687	76	6	17	117
State University of New York							
Upstate Medical Center [1-3]	Syracuse, N. Y.	J. B. Richmond	8,598	79	5	11	233
Grasslands Hospital [1-3]	Valhalla, N. Y.	D. A. Wilcox	378	10	1	3	175
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	E. C. Curnen	1,968	67	6	12	175
Charlotte Memorial Hospital [1]	Charlotte, N. C.	C. G. Watkins	536	6	1	2	250
Duke Hospital [1-3-701]	Durham, N. C.	J. Harris	2,606	97	..	9	102
Rex Hospital [1]	Raleigh, N. C.	C. R. Bugg	2,371	...	1	2	350
Babies Hospital [1-3]	Wilmington, N. C.	J. B. Sidbury	1,895	16	..	2	300
City Memorial Hospital [1-3]	Winston-Salem, N. C.	F. A. Blount	1,534	1	1	2	300
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	W. M. Kelsey	1,564	46	3	7	166
Mary Day Nursery and Children's Hospital [1]	Akron, Ohio	N. Miller	3,339	51	6	12	250
University of Cincinnati School of Medicine							
Hospital Group							
Children's Hospital [1]	Cincinnati	A. A. Weech	3,761	99	12	24	75
Cincinnati General Hospital [1-3]	Cincinnati	A. A. Weech	1,010	61	..	..	...
Cleveland Clinic Hospital [1-3]	Cleveland	R. D. Mercer	2,074	12	3	5	175
Cuyahoga County Hospital [1-3]	Cleveland	F. C. Robbins	1,666	58	5	12	162
Department of Contagious Diseases			.....	...	..	..	...
St. Luke's Hospital [1-3]	Cleveland	R. G. Hodges	1,009	19	2	3	140
University Hospital [1-3]	Cleveland	W. Wallace	2,919	101	5	12	150
Children's Hospital [1]	Columbus, Ohio	E. H. Baxter	4,079	123	10	23	175
University of Oklahoma Hospitals [1-3-331]	Oklahoma City	H. Riley	1,458	82	4	10	200
Hillcrest Medical Center [1]	Tulsa, Okla.	R. Wadsworth	3,608	29	4	6	150
St. John's Hospital	Tulsa, Okla.	G. R. Russell	4,459	30	2	4	175
University of Oregon Medical							
School Hospitals and Clinics [1-3]	Portland, Ore.	A. J. Hill, Jr.	1,139	47	4	8	125
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	E. F. Rabe	706	10	1	2	175
Harrisburg Hospital [1-3]	Harrisburg, Pa.	R. T. Tursky	2,154	10	1	2	250
Harrisburg Polyclinic Hospital	Harrisburg, Pa.	M. Ames	2,849	26	1	2	250
Albert Einstein Medical Center [1-3]	Philadelphia	A. Capper	1,720	16	2	4	125
Children's Hospital [1-3]	Philadelphia	J. Stokes, Jr.	6,206	74	9	22	50
[illegible] Hospital [1-3]	Philadelphia	J. C. Williams	1,374	10	2	2	175
[illegible] [1-3]	Philadelphia	J. A. Ritter	357	2	1	1	...
Hahnemann Medical College and Hospital [1-3]	Philadelphia	C. C. Fischer	1,390	33	4	8	75
St. Luke's and Children's Medical Center	Philadelphia	H. A. Agerty	547	13	3	3	125
Hospital of the University of Pennsylvania [1-3]	Philadelphia	L. Barness	658	15	3	7	...
Hospital of the Woman's Medical College							
of Pennsylvania [1-3]	Philadelphia	J. Crump	1,121	7	1	3	110
Jefferson Medical College Hospital [1-3]	Philadelphia	H. G. Keitel	656	16	4	7	100
Philadelphia General Hospital [1-3]	Philadelphia	P. Gyorgy	1,523	33	4	8	121
Temple University Medical School Hospitals							
St. Christopher's Hospital for Children [1-3]	Philadelphia	W. E. Nelson	4,091	82	9	23	...
Temple University Hospital [1-3]	Philadelphia	W. E. Nelson	21	..	..	..	...
Allegheny General Hospital [1]	Pittsburgh	J. W. Leech	709	20	1	2	200
Health Center Hospitals of the University of							
Pittsburgh School of Medicine							
Children's Hospital [1-3]	Pittsburgh	E. R. McCluskey	2,133	85	10	21	125
Robert Packer Hospital [1-3]	Sayre, Pa.	D. S. Motsay	2,674	31	1	3	225
Rhode Island Hospital [1-3-350]	Providence, R. I.	B. Feinberg	1,307	13	3	6	125
Teaching Hospitals of the Medical College of							
South Carolina	Charleston, S. C.	J. R. Paul, Jr.	2,899	54	2	6	137
Medical College Hospital			.....	...	..	..	...
Roper Hospital			.....	...	..	..	...
Columbia Hospital of Richland County [1]	Columbia, S. C.	J. R. Harvin	3,324	51	1	2	175

Numerical and other references will be found on pages 640 through 642.

18. PEDIATRICS—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[a]	Total Residencies Offered[a]	Beginning Stipend (Month)
University of Tennessee Memorial Research Center and Hospital [1-3]	Knoxville, Tenn.	H. S. Christian	479	8	1	2	320
City of Memphis Hospitals [1-3]	Memphis, Tenn.	F. T. Mitchell	2,530	88	5	12	150
Le Bonheur Children's Hospital [1-3-352]	Memphis, Tenn.	C. B. Etter	4,930	38	2	3	125
Baptist Hospital [1-3]	Nashville, Tenn.	J. M. Strayhorn	1,739	8	2	4	300
George W. Hubbard Hospital [1-3]	Nashville, Tenn.	E. P. Crump	746	5	2	6	125
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	A. Christie	1,222	50	4	6	50
Driscoll Foundation Children's Hospital [1-3]	Corpus Christi, Texas	J. F. McKemie	1,013	74	2	6	200
Children's Medical Center [1-3-358]	Dallas, Texas	E. Pratt	1,919	25	8	16	150
St. Paul's Hospital [1-3]	Dallas, Texas	W. C. Hawkins	2,701	20	2	4	150
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	A. E. Hansen	970	77	6	14	160
Baylor University College of Medicine Affiliated Hospitals							
Hermann Hospital [1-3]	Houston, Texas	R. J. Blattner	879	20	2	6	125
Jefferson Davis Hospital [1-3]	Houston, Texas	R. J. Blattner	1,448	63	7	11	75
Methodist Hospital [1-3]	Houston, Texas	E. B. Brandes	114	..	1	2	220
Texas Children's Hospital [1-3]	Houston, Texas	R. J. Blattner	6,155	153	3	7	100
St. Joseph's Hospital [1-3]	Houston, Texas	R. D. Lomas	4,395	17	1	2	220
University of Texas Postgraduate School of Medicine Affiliated Hospitals							
Robert B. Green Memorial Hospital [1-3-382]	San Antonio, Texas	C. B. Alexander	844	76	2	4	150
Santa Rosa Hospital [1-3]	San Antonio, Texas	M. L. Thornton	3,296	58	1	1	150
Salt Lake County General Hospital [3]	Salt Lake City	J. Bosma	367	15	4	10	220
University of Vermont Affiliated Hospitals							
De Goesbriand Memorial Hospital	Burlington, Vt.	J. Lucey	715	5	1	3	167
Mary Fletcher Hospital [1-3]	Burlington, Vt.	R. J. McKay	543	23	2	3	100
University of Virginia Hospital [1-3]	Charlottesville, Va.	W. W. Waddell, Jr.	901	30	2	5	50
Medical College of Virginia—Hospital Division [1-3]	Richmond, Va.	L. E. Sutton, Jr.	1,691	67	8	14	75
University of Washington Affiliated Hospitals							
Children's Orthopedic Hospital [1-3]	Seattle	A. Rembe	2,873	94	..	..	160
King County Hospital Unit No. 1 (Harborview) [1]	Seattle	R. A. Aldrich	913	13	2	4	125
Beckley Memorial Hospital [1-3]	Beckley, W. Va.	S. J. Winter	910	10	1	2	300
Memorial Hospital [1-3]	Charleston, W. Va.	J. Basman	1,126	10	1	2	250
University Hospitals [1-3]	Madison, Wis.	N. Smith	997	51	4	12	100
Milwaukee Children's Hospital [1-3]	Milwaukee	G. H. Wegmann	3,703	72	6	11	215
Milwaukee County Hospital [1-3]	Milwaukee	M. G. Peterman	2,808	35	3	5	207
Gorgas Hospital [1]	Ancon, C. Z.	D. Hirschl	814	10	1	2	345
Kauikeolani Children's Hospital [1-3]	Honolulu, T. H.	D. F. B. Char	4,343	37	4	8	200
Bayamon Charity District Hospital [1-3]	Bayamon, P. R.	E. L. Matta	1,796	56	2	3	250
San Juan City Hospital [1-3]	San Juan, P. R.	A. Ortiz	1,780	52	4	10	150

Residency programs in the following hospitals have been approved by the Council, the American Academy of Pediatrics and the American Board of Pediatrics, through the Residency Review Committee for Pediatrics, as offering full training of two years' duration through affiliation with a fully approved program.

Hospitals, 32; Assistant Residencies and Residencies, 76

NONFEDERAL

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[a]	Total Residencies Offered[a]	Beginning Stipend (Month)
Seaside Memorial Hospital [1-3-56]	Long Beach, Calif.	W. Buerger	2,822	5	1	1	185
San Diego County General Hospital [1-3-74]	San Diego, Calif.	H. G. Kellogg	1,059	...	1	1	250
Mount Zion Hospital [1-3-395]	San Francisco	S. J. Robinson	1,301	24	..	1	150
Community Hospital of San Mateo County [1-305]	San Mateo, Calif.	W. C. Layton	112	2	1	1	300
St. John's Hospital [1-3-90]	Santa Monica, Calif.	A. B. Polson	1,585	9	2	2	200
Waterbury Hospital [1-396]	Waterbury, Conn.	J. H. Root, Jr.	2,370	6	1	2	225
Variety Children's Hospital [1-3-397]	Miami, Fla.	J. Lancaster	3,369	33	3	6	215
Henrietta Egleston Hospital for Children [1-3-123]	Atlanta, Ga.	M. H. Roberts	1,074	17	1	2	150
Illinois Masonic Hospital [1-3-133]	Chicago	M. R. Jackson	1,765	2	4	4	115
Evanston Hospital [1-3-398]	Evanston, Ill.	A. L. Newcomb	1,370	11	1	1	225
Hotel Dieu-Sister's Hospital [156]	New Orleans	H. C. Tolmas	2,136	16	2	3	225
Southern Baptist Hospital [1-156]	New Orleans	B. C. Mason	2,137	6	1	2	225
Mercy Hospital [1-3-161]	Baltimore	F. Smith	528	14	1	2	275
Herman Kiefer Hospital [1-3-18]	Detroit	D. C. Young	1,716	28	3	3	554
St Francis Hospital [1-3-399]	Trenton, N. J.	H. Davis	4,698	20	1	1	210
St. Peter's Hospital [3-275]	Albany, N. Y.	H. F. Leahy	1,523	12	2	3	225
Wyckoff Heights Hospital [1-3-265]	Brooklyn, N. Y.	V. Larkin	545	17	2	4	100
Flushing Hospital and Dispensary [1-3-258]	Flushing, N. Y.	H. T. Vogel	643	23	1	2	175
Mary Immaculate Hospital [1-3-253]	Jamaica, N. Y.	A. A. Trivilino	2,885	36	1	2	160
Misericordia Hospital [1-3-400]	New York City	F. Castrovinci	655	4	1	2	125
St. Francis Hospital [1-3-265]	New York City	R. P. Drago	832	8	2	4	125
Watts Hospital [1-3-401]	Durham, N. C.	A. H. London	1,912	4	..	2	300
Good Samaritan Hospital [1-3-311]	Cincinnati	N. Ryan	2,942	12	1	2	250
Jewish Hospital [1-3-398]	Cincinnati	J. I. Klein	1,821	7	1	2	195
Mercy Hospital [1-3-198]	Toledo, Ohio	J. J. Tansey	2,429	6	1	1	275
Trumbull Memorial Hospital [1-314]	Warren, Ohio	R. P. Ostergard	2,038	28	1	2	300
Charles V. Chapin Hospital [1-3-184]	Providence, R. I.	M. Adelmann	1,139	9	4	8	150
Greenville General Hospital [1-402]	Greenville, S. C.	J. Ott	1,420	13	..	1	275
T. C. Thompson Children's Hospital [1-3-123]	Chattanooga, Tenn.	G. C. Gibson, Jr.	3,079	56	3	5	250
Baptist Memorial Hospital [1-3-352]	Memphis, Tenn.	G. Lovejoy	2,636	18	1	1	200
St. Joseph Hospital [1-3-403]	Memphis, Tenn.	H. Jacobson	1,431	8	1	2	250
De Paul Hospital [1-3-308]	Norfolk, Va.	H. W. Fink	2,727	20	1	1	200

Residency programs in the following hospitals have been approved by the Council, the American Academy of Pediatrics and the American Board of Pediatrics, through the Residency Review Committee for Pediatrics, as offering training of one year's duration and are in the process of being integrated with a fully approved program. Approval for one year of training has been granted up to June 30, 1959.

Hospitals, 2; Assistant Residencies and Residencies, 1

NONFEDERAL

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[a]	Total Residencies Offered[a]	Beginning Stipend (Month)
Central Maine General Hospital [1]	Lewiston, Maine	H. O. Thacher	462	6	1	1	225
Cooper Hospital [1-3]	Camden, N. J.	V. Del Duca	806	14	..	..	200

Numerical and other references will be found on pages 640 through 642.

19. PHYSICAL MEDICINE AND REHABILITATION

Residency programs in the following hospitals have been approved by the Council and the American Board of Physical Medicine and Rehabilitation, through the Residency Review Committee for Physical Medicine and Rehabilitation, as offering acceptable training in the specialty.

Hospitals 66; Assistant Residencies and Residencies, 313

Name of Hospital	Location	Chief of Service	Inpatients Treated	Number of Treatments	First Year Residencies Offered *	Total Residencies Offered *	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES ARMY								
Letterman Army Hospital [1-3]	San Francisco	W. Moore, Jr.	51,064	139,038	1	3	3	...
Fitzsimons Army Hospital [1-3]	Denver	J. W. Thomas	5,714	155,861	1	3	3	...
Army Medical Center [1-2]	Washington, D. C.	A. F. Mastellone	3,356	178,633	1	3	3	...
NONFEDERAL AND VETERANS ADMINISTRATION								
Los Angeles County Hospital [1]	Los Angeles	E. Austin	.....	18,251	1	3	3	246
Veterans Admin. Hospital [1-3]	Los Angeles	K. H. Haase	16,157	138,168	3	9	3	...
White Memorial Hospital [1-3]	Los Angeles	F. B. Moor	21,745	65,235	1	3	3	215
University of California Hospital [3]	San Francisco	G. Bard	12,653	18,856	1	4	3	...
Kaiser Foundation Hospital California Rehabilitation Center	Vallejo, Calif.	....	.....	......	..	..	1	...
University of Colorado Medical Center Colorado General Hospital [1-3]	Denver	J. W. Gersten	1,493	27,642	2	5	3	180
Veterans Admin. Hospital [1-3]	Denver	C. C. Hoffman	884	34,025	..	1	3	...
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	T. F. Hines	1,215	21,284	1	3	3	140
State of Connecticut Veterans Home and Hospital [1-3]	Rocky Hill, Conn.	W. T. Liberson	2,445	66,592	2	3	3	...
District of Columbia General Hospital [1-3]	Washington, D. C.	J. Buchanan	6,561	57,313	1	1	3	233
spital [1-3]	Washington, D. C.	C D. Shields	1,530	7,853	2	4	1	250
rsity Hospital [1-3]	Washington, D. C.	C. Wise	2,844	15,536	1	3	3	150
[1-3]	Coral Gables, Fla.	J. W. Gibson	2,153	40,018	..	..	3	...
Georgia Warm Springs Foundation [1-2]— Emory University Hospital [1-3]	Warm Springs, Ga.	R L. Bennett	1,877	143,461	2	7	3	245
Loyola University (Stritch School of Medicine) Affiliated Hospitals City of Chicago Department of Welfare Convalescent Home[1]	Chicago	A. A Rodriquez	165	18,943	2	4	3	300
Northwestern University Medical Center Veterans Admin. Research Hospital [1-3]	Chicago	L. B. Newman	2,146	46,195	1	2	3	...
Institute of Physical Medicine and Rehabilitation [1-2-31]	Peoria, Ill.	H. W Kendall	2,608	21,876	2	6	3	275
University of Kansas Medical Center [1-3]	Kansas City, Kan.	D. Rose	13,017	43,794	1	4	3	125
Veterans Admin. Hospital [1-3]	Kansas City, Mo.	R. R. Beatty	3,273	60,038	..	..	..	...
University of Louisville Medical Center Louisville General Hospital [1-3]	Louisville, Ky.	R. McMorris	12,941	60,293	3	3	3	300
Massachusetts General Hospital [1-3]	Boston	A. L. Watkins	872	11,532	1	1	3	67
Veterans Admin. Hospital [1-3-143]	Boston (Jamaica Plain)	F. Friedland	3,027	157,428	1	3	3	...
University Hospital [1-3-191]	Ann Arbor, Mich.	J. W. Rae, Jr.	35,277	.....	2	6	3	160
University of Minnesota Affiliated Hospitals		F. Kottke	.....	.....	..	..	3	...
University Hospital [1-3]	Minneapolis	....	2,759	91,542	3	11	..	300
Veterans Admin. Hospital [1-3]	Minneapolis	....	.....	.....	..	..	..	...
Mayo Foundation	Rochester, Minn.	F. H. Krusen	16,980	97,462	3	9	3	175
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	T. P. Anderson	14,219	30,849	1	2	3	218
Veterans Admin. Hospital [1-3-230]	East Orange, N. J.	C. Brooke	1,820	107,889	..	1	3	...
Veterans Admin. Hospital [1-3-245]	Albany, N. Y.	J. Ehrlich	5,860	114,047	..	1	3	...
Jewish Chronic Disease Hospital [1-3]	Brooklyn, N. Y.	J. B. Rogoff	489	93,757	2	6	3	175
Bellevue Hospital Center Div. III—New York University College of Medicine [-266]	New York City	H. Rusk	1,353	26,886	30	69	3	89
Bronx Municipal Hospital Center [1-3]	New York City	A. S. Abramson	3,282	59,539	3	9	3	125
Goldwater Memorial Hospital [1-3-276]	New York City	M. Dacso	814	127,891	3	7	3	105
Hospital for Joint Diseases [1-3]	New York City	A. S. Russek	13,628	31,400	1	1	1	80
Montefiore Hospital [1-2]	New York City	K. Harpuder	4,492	49,099	1	2	3	187
Mount Sinai Hospital [1-3]	New York City	W. Bierman	10,567	39,915	1	1	3	75
New York Medical College—Metropolitan Medical Center		J. S. Tobis	.....	.....	..	..	3	...
Bird S. Coler Memorial Hospital and Home [1 4]	New York City	....	1,503	128,767	..	11	..	105
Metropolitan Hospital [1-3]	New York City	....	8,209	66,810	1	3	..	105
Presbyterian Hospital [1]	New York City	R. C. Darling	53,366	98,459	1	5	3	308
St. Vincent's Hospital [1-3]	New York City	S. S. Sverdlik	15,789	29,203	1	3	3	125
Veterans Admin. Hospital (Bronx) [1-3]	New York City	A. Ebel	4,184	333,644	2	6	3	...
Veterans Admin. Hospital (Manhattan) [1-3]	New York City	B Stoll	2,483	264,513	3	8	3	...
Veterans Admin. Hospital [1-3]	Durham, N. C.	H. T. Zankel	1,296	42,800	1	3	3	...
Cleveland Clinic Hospital [1-3]	Cleveland	P. A. Nelson	5,320	28,085	1	3	3	175
Cuyahoga County Hospital [1-3]	Cleveland	N. Coyne	18,295	55,101	2	5	1	162
Highland View-Cuyahoga County Hospital [1-2]	Cleveland	M. Peszczynski	2,171	49,469	2	6	3	190
Veterans Admin. Hospital [1-3]	Cleveland	R. Lowry	4,541	83,898	2	4	1	...
Ohio State University Hospitals University Hospital [1-3]	Columbus, Ohio	R. E. Worden	24,069	52,628	2	6	3	177
Veterans Admin. Hospital [1-3]	Dayton, Ohio	L. Rosenberg	1,832	107,851	1	3	1	...
Veterans Admin. Hospital [1-3]	Portland, Ore.	E. W Fowlks	3,188	175,200	1	2	3	...
Hospital of the University of Pennsylvania [1-3]	Philadelphia	W. Erdman	2,234	25,017	2	6	3	...
Philadelphia General Hospital [1-3]	Philadelphia	A Martucci	10,299	139,762	1	3	3	300
Veterans Admin. Hospital [1-3]	Philadelphia	R. A. Schlesinger	912	59,026	1	2	3	...
Veterans Admin. Hospital [1-3]	Pittsburgh	S. Machover	2,011	123,524	..	2	2	...
Veterans Admin. Hospital [1-3]	Memphis, Tenn.	B. B. Sutton	8,724	175,768	1	1	3	...
Baylor University Hospital [1-3]	Dallas, Texas	E. Krusen	33,441	101,949	1	3	3	175
Gonzales Warm Springs Rehabilitation Foundation	Gonzales, Texas	O. F. Von Werssowetz	2,603	92,516	2	4	1	500
Baylor University College of Medicine Affiliated Hospitals Veterans Admin. Hospital [1-3]	Houston, Texas	L. A. Leavitt	9,849	131,188	2	6	8	...

Numerical and other references will be found on pages 640 through 642.

21. PREVENTIVE MEDICINE—*Continued*

Department of Health	Location	Director	Local Areas	Population	Length of Approved Program (Years)	Stipend
State of Maryland	Baltimore	E. Davens	Anne Arundel County	171,700*	2	542
			Baltimore City	974,000*	....	......
			Baltimore County	370,400*	....	......
			Harford County	66,000*	....	......
			Montgomery County	256,500*	....	......
			Washington County	85,700*	....	......
State of Michigan	Lansing	A. E. Heustis	Calhoun County	135,260	2	400
			Detroit City	1,920,000	....	......
			Michigan Dept. of Health	(m)	....	......
State of Minnesota	Minneapolis	R. N. Barr, Secy. and Ex. Off.	Minneapolis City	542,000*	2	400
			Olmsted County including Rochester City	48,395*	....	......
State of Mississippi	Jackson	J. A. Milne	Forrest County	....	2	......
			Hinds County	....	....	......
New York City	New York City	R. P. Kandle, Dep. Com.	(n)	8,010,000	2	443
State of New York	Albany	H. E. Hilleboe	(l)	941,000	2	511
State of North Carolina	Raleigh	J. W. R. Norton	Charlotte-Mecklenburg County	225,326*	2	......
			Forsyth-Winston-Salem	158,422*	....	......
			Halifax	59,539*	....	......
			Orange-Pearson-Chatham-Lee	117,797*	....	......
			Pitt	63,377*	....	......
State of Oklahoma	Oklahoma City	J. W. Shackleford	Pottawatomie-Pontotoc Counties	....	2	......
			Tulsa (City) and Tulsa County	....	....	......
State of Oregon	Portland	H. M. Erickson	Multnomah County (s)	124,060	2	700(i)
			Clackamas	106,090	....	......
			Jackson	71,750	....	......
			Lane	151,690	....	......
State of Texas	Austin	F. O. Kluth	(g)	596,163	2	660(p)
State of Virginia	Richmond	M. [illegible]	[illegible] County	158,410	1	764
State of Washington	Seattle	B. [illegible]	[illegible]	....	2	692
			[illegible]	78,400*	....	......
			Clark-Skamania	91,000*	....	......
			King-Seattle	852,700*	....	......
			Spokane City	188,400*	....	......
			Tacoma-Pierce County	318,800*	....	......

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* Estimated.

(a) Excludes the city of Wilmington.

(b) To those planning to work in state.

(c) Excludes Chicago, Evanston, Oak Park, Stickney Township, and Winnetka (including Glencoe, Kenilworth, Northbrook, and remainder of New Trier Township), all with full-time health officers.

(d) Assistance can be arranged for securing the MPH degree during or immediately after the first residency year. Appointments can be effective the first of any month. Appointments normally are limited to those training for service in Illinois. Exceptions may be made in special cases.

(e) Training is given under one director in both the City and County Health Departments.

(f) Arrangements for remuneration made on an individual basis.

(g) 43 city-county or county health departments and 6 city health departments in which training may be given depending upon local conditions and the needs and desires of the resident.

(h) State of Georgia with emphasis on 6 major districts.

(i) Assistance can be arranged for securing the MPH degree after successful completion of residency experience. Appointments will be limited to those training for service in Oregon.

(j) Combined one year program Fort Dix Health Center, Fort Dix., N. J., and Headquarters First U. S. Army, Preventive Medicine Division, Governor's Island, New York City, for second year of field training.

(l) Training is given in any one of 10 city health departments, 19 county health departments, or 14 district offices within the state.

(m) Training to be with Michigan Department of Health, with field experience in local health departments.

(n) Includes training at Montefiore Hospital.

(o) Combined one year of training, second year of field training, Fort Ord and Presidio of San Francisco, Calif.

(p) Stipend offered only to those residents who plan to remain in public health work in the state at least six years.

(r) Arrangements for remuneration made upon determination of field of interest and location desired.

(s) City of Portland population (412,100) is not included in this 1937 State Census estimate.

22. PROCTOLOGY

Residency programs in the following hospitals have been approved by the Council and the American Board of Proctology, through the Residency Review Committee for Proctology, as offering acceptable training in the specialty.

Hospitals, 13; Assistant Residencies and Residencies, 32

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Length of Approved Program (Years)	Beginning Stipend (Month)
NONFEDERAL								
White Memorial Hospital [1-3]	Los Angeles	H. M. Young	249	1	1	2	2	215
Ochsner Foundation Hospital [1-3]	New Orleans	M. O. Hines	351	1	1	2	2	300
Ferguson, Droste, Ferguson Hospital [1-3]	Grand Rapids, Mich.	J. A. Ferguson	2,046	25	2	4	2	275
University of Minnesota Hospitals [1-3]	Minneapolis	W. Fansler	Incl. in Surg.		1	1	2	209
Mayo Foundation	Rochester, Minn.	R. J. Jackman	792	..	2	8	2	175
Buffalo General Hospital [1-3]	Buffalo	L. S. Knapp	546	3	1	1	2	175
Millard Fillmore Hospital [1-3]	Buffalo	W. H. Bernhoft	229	1	..	1	2	285
Youngstown Hospital [1-3]	Youngstown, Ohio	P. J. Fuzy, Jr.	752	..	1	2	2	325
Allentown Hospital [1-3]	Allentown, Pa.	G. Kratzer	892	3	1	1	2	225
Temple University Hospital [1-3]	Philadelphia	H. E. Bacon	746	3	2	5	2	...
Health Center Hospitals of the University of Pittsburgh School of Medicine Presbyterian Hospital [1-3]	Pittsburgh	K. Zimmerman	969	7	1	2	2	175
Baylor University Hospital [1-3]	Dallas, Texas	C. Rosser	1,043	2	1	1	2	200
Milwaukee County Hospital [1-3]	Milwaukee	L. J. Schwade	1,141	..	..	2	2	207

Numerical and other references will be found on pages 640 through 642.

23. PSYCHIATRY

Residency programs in the following hospitals have been approved for THREE years of training by the Council and the American Board of Psychiatry and Neurology, through the Residency Review Committee for Psychiatry and Neurology. (Applicants intending to qualify for examination by the American Board of Psychiatry and Neurology, Inc., should refer to the Board requirements that the candidate have had at least two of the three years of his training in a program or programs approved at the two or three year level—see summary of requirements American Board of Psychiatry and Neurology, Inc., page 686

Hospitals, 185; Assistant Residencies and Residencies, 2927

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
UNITED STATES ARMY								
Letterman Army Hospital $^{1-3}$	San Francisco	T. Kiersch	12	964	1	6	18	...
Army Medical Center $^{1-3}$	Washington, D. C.	R. E. Clausen, Jr.	..	1,034	1	8	24	...
UNITED STATES NAVY								
U. S. Naval Hospital $^{1-3}$	Bethesda, Md.	J. E. Nardini	..	651	...	5	13	...
UNITED STATES PUBLIC HEALTH SERVICE								
U. S. Public Health Service Hospital $^{1-145}$	Lexington, Ky.	J. A. Grider	30	3,404	5	4	12	...
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE								
Freedmen's Hospital $^{1-3}$	Washington, D. C.	E. Y. Williams	..	276	5	1	6	308
St. Elizabeth's Hospital $^{1-3}$	Washington, D. C.	W. Overholser	20	8,511	296	6	24	308
NONFEDERAL AND VETERANS ADMINISTRATION								
University of Alabama Medical Center								
Crippled Children's Hospital $^{1-3}$	Birmingham, Ala.	C. L. Lamar	..	.....	...	..	..	...
University Hospital and Hillman Clinic $^{1-3}$	Birmingham, Ala.	E. L. Caveny	..	546	...	2	8	250
Veterans Admin. Hospital $^{1-3}$	Birmingham, Ala.	J. R. Jarvis	..	392	...	1	1	...
University of Arkansas Medical Center $^{1-3}$	Little Rock, Ark.	W. G. Reese	..	...	...	2	6	200
Veterans Admin. Hospital ^{1}	North Little Rock, Ark.	E. S. Chappell	49	3,394	51	4	12	...
Camarillo State Hospital $^{1-52}$	Camarillo, Calif.	F. H. Garrett	..	10,846	169	4	12	613
Veterans Admin. Hospital $^{1-3-58}$	Long Beach, Calif.	M. Feld	..	496	1	1	3	...
Los Angeles County Hospital ^{1}	Los Angeles	J. McGinnis	..	8,925	11	4	10	246
Mount Sinai Hospital ^{1}	Los Angeles	S. D. Schwartz	..	123	...	2	6	110
University of California Hospital $^{1-3-63}$	Los Angeles	N. Q. Brill	..	60	...	6	21	229
Veterans Admin. Hospital $^{1-3-66}$	Los Angeles	J. T. Ferguson	11	4,076	148	20	50	...
Metropolitan State Hospital $^{1-3-58-69-70}$	Norwalk, Calif.	R. E. Wyers	15	3,823	51	10	26	415
Veterans Admin. Hospital $^{1-3-73}$	Palo Alto, Calif.	H. D. Von Witzleben	14	2,064	25	13	26	...
Langley-Porter Clinic $^{1-75}$	San Francisco	A. Simon	13	264	...	13	53	200
Stanford University Hospitals $^{1-3}$	San Francisco	G. S. Johnson	..	194	...	2	6	100
Veterans Admin. Hospital $^{1-3}$	Sepulveda, Calif.	N. C. Mace	..	1,898	92	6	12	...
Mendocino State Hospital ^{1}	Talmadge, Calif.	D. L. Lieberman	..	895	104	2	6	...
University of Colorado Medical Center								
Colorado Psychopathic Hospital $^{1-3}$	Denver	H. S. Gaskill	16	728	1	12	40	216
Veterans Admin. Hospital $^{1-3-95}$	Denver	L. L. Woodfin	..	568	3	3	6	...
Institute of Living	Hartford, Conn.	F. J. Braceland	..	983	4	8	16	333
Connecticut State Hospital $^{1-3}$	Middletown, Conn.	H. S. Whiting	..	4,585	65	8	24	455
Grace-New Haven Community Hospital $^{1-3}$	New Haven, Conn.	T. Lidz	17	45	...	..	14	75
Fairfield State Hospital ^{1}	Newtown, Conn.	J. E. Oltman	..	4,431	119	10	26	435
Norwich State Hospital $^{1-3}$	Norwich, Conn.	R. H. Kettle	..	4,348	58	9	25	455
Veterans Admin. Hospital $^{1-3-109-110}$	West Haven, Conn.	J. W. Higgins	18	476	2	13	27	...
Delaware State Hospital $^{1-3}$	Farnhurst, Del.	M. A. Tarumianz	19	1,902	46	4	14	200
Georgetown Univer [illegible]	D. C.	G. N. Raines	..	......	...	8	24	210
Jackson Memorial [illegible]	Fla.	J. M. Caldwell	..	907	...	9	19	166
Medical College of Georgia Hospitals								
Eugene Talmadge Memorial Hospital	Augusta, Ga.	E. J. McCranie	..	28	...	3	6	250
University Hospital ^{1}	Augusta, Ga.	H. Cleckley	..	705	...	1	1	200
Veterans Admin. Hospital $^{1-3}$	Augusta, Ga.	M. Dunn	21	2,151	25	1	6	...
Chicago State Hospital $^{1-3}$	Chicago	P. Bailey	23-84	7,224	65	15	50	300
Michael Reese Hospital $^{1-3}$	Chicago	R. R. Grinker, Sr.	..	686	1	5	15	125
Mount Sinai Hospital $^{1-3}$	Chicago	I. Finkelman	..	448	2	1	3	225
Northwestern University Medical Center $^{1-3-106}$	Chicago	B. Boshes	.	4,189	79	10	30	240
Chicago Wesley Memorial Hospital $^{1-3}$	Chicago	B. Boshes	..	581	3	1	1	125
Veterans Admin. Hospital $^{1-136}$	Downey, Ill.	A. Paunez	26	3,352	76	8	18	...
Presbyterian-St. Luke's Hospital								
Presbyterian Hospital Division $^{1-3}$	Chicago	L. W. Avery	..	138	...	1	3	125
St. Luke's Hospital Division $^{1-3}$	Chicago	R. P. Mackay	22	344	1	1	3	125
Stritch School of Medicine Affiliated Hospitals		J. J. Madden	..	...	...	..	..	...
Loretto Hospital $^{1-3}$	Chicago		..	575	2	1	2	200
Mercy Hospital $^{1-3-129}$	Chicago		..	316	...	3	9	200
University of Chicago Clinics $^{1-3}$	*Chicago*	*C. K. Aldrich*	..	*151*	...	*4*	*13*	*200*
University of Illinois Neuropsychiatric Institute $^{1-3}$	Chicago	F. J. Gerty	27	198	...	4	11	140
Veterans Admin. West Side Hospital $^{1-3}$	Chicago	L. Halperin	..	383	1	2	6	...
Veterans Admin. Hospital $^{1-3}$	Hines, Ill.	L. Jensen	25	557	3	5	20	...
Indiana University Affiliated Hospitals			..	...	...	12	39	...
Indianapolis General Hospital $^{1-3}$	Indianapolis	D. Schuster	28	510	5	..	..	205
Indiana University Medical Center ^{1}	Indianapolis	J. I. Nurnberger	28	Incl. in Med. & Ped.		..	..	405
Larue D. Carter Memorial Hospital	Indianapolis	D. F. Moore	..	600	2	..	..	405
Veterans Admin. Hospital $^{1-3}$	Indianapolis	T. Tausig	..	419	2	..	..	...
Mental Health Institute $^{1-3}$	Cherokee, Iowa	W. C. Brinegar	..	1,813	31	2	2	425
Iowa State Psychopathic Hospital $^{1-3}$	Iowa City	P. E. Huston	..	337	...	4	12	300
University of Kansas Medical Center $^{1-3}$	Kansas City, Kan.	W. Roth, Jr.	..	165	...	4	12	175
Veterans Admin. Hospital $^{1-3}$	Kansas City, Mo.	W. E. Olson	..	204	...	..	..	...
C. F. Menninger Memorial Hospital $^{1-3}$	Topeka, Kan.	K. A. Menninger	29	229	...	..	7	300
Topeka State Hospital $^{1-3}$	Topeka, Kan.	P. E. Feldman	29	1,740	51	20	56	324
Veterans Admin. Hospital $^{1-3-144}$	Topeka, Kan.	D. W. Hammersley	29	1,616	21	20	62	...
University of Louisville Medical Center								
Central State Hospital $^{1-3}$	Lakeland, Ky.	C. W. Morris	..	2,500	16	1	1	200
Veterans Admin. Hospital	Lexington, Ky.	See Listing of This Hospital in Following Section						
Louisville General Hospital $^{1-3}$	Louisville, Ky.	W. K. Keller	..	1,090	3	3	3	200
Norton Memorial Infirmary	Louisville, Ky.	S. S. Ackerly	..	294	...	..	4	...
Veterans Admin. Hospital $^{1-3}$	Louisville, Ky.	A. Guiglia	32	494	...	..	2	...

Numerical and other references will be found on pages 640 through 642.

23. PSYCHIATRY—Continued

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[8]	Beginning Stipend (Month)
Charity Hospital of Louisiana								
Louisiana State University Unit [1]	New Orleans	C. W[illegible]	35	861	7	4	12	100
Tulane University Unit [1]	New Orleans	R. [illegible]	34	874	6	4	12	100
Johns Hopkins Hospital [1-3]	Baltimore	J. C. Whitehorn	36	252	2	7	21	250
University Hospital [1]	Baltimore	J. E. Finesinger	..	495	3	8	19	150
Spring Grove State Hospital [1-3]	Catonsville, Md.	I. Tuerk	..	5,103	84	9	18	317
Veterans Admin. Hospital [1-3-168]	Perry Point, Md.	W. M. Harris	37	2,329	50	5	11	...
Sheppard and Enoch Pratt Hospital [1-3]	Towson, Md.	H. M. Murdock	..	477	3	4	10	367
Veterans Admin. Hospitals of the Boston Area								
Veterans Admin. Hospital [1-3-168]	Bedford, Mass.	B. S. Wells	39	3,223	29	3	9	...
Veterans Admin. Hospital [1-3-182]	Boston (Jamaica Plain)	S. Tartakoff	..	948	3	10	50	...
Veterans Admin. Hospital [1-3-168]	Brockton, Mass.	A. S. Mason	..	1,510	19	6	6	...
Boston State Hospital [1-3]	Boston	J. Mann	..	4,454	122	16	30	262
Massachusetts General Hospital								
General Hospital Division [1-3]	Boston	E. Lindemann	40	384	...	2	4	67
McLean Hospital [1-3]	Belmont, Mass.	A. H. [illegible]	40	447	12	..	15	...
Massachusetts Memorial Hospitals [1-3-178]	Boston	W. [illegible]	38	110	...	..	12	200
Massachusetts Mental Health Center [1]	Boston	H. [illegible]	..	783	2	16	40	250
Worcester State Hospital [1-3]	Worcester, Mass.	S. Kligerman	..	2,979	31	7	21	255
University Hospital [1-3-191]	Ann Arbor, Mich.	R. W. Waggoner	..	642	1	10	41	335
Henry Ford Hospital [1-3]	Detroit	L. D. Proctor	41	349	1	1	3	333
Lafayette Clinic [1-3]	Detroit	J. S. Gottlieb	..	291	...	12	34	500
Receiving Hospital [1-3]	Detroit	J. M. Dorsey	41	5,988	15	1	5	303
Wayne County General Hospital and Infirmary [1-3]	Eloise, Mich.	J. A. Belisle	10	[illegible]	17	5	15	554
Northville State Hospital [1-3]	Northville, Mich.	P. N. Brown	..	2,530	28	5	15	541
Pontiac State Hospital [1-3]	Pontiac, Mich.	J. A. La Core	10	4,150	91	8	20	541
Ypsilanti State Hospital [1-3]	Ypsilanti, Mich.	O. R. Yoder	..	5,086	98	6	18	541
University of Minnesota Hospitals [1-3-207]	Minneapolis	D. W. Hastings-R. Jensen	..	731	...	4	16	209
Veterans Admin. Hospital [1-3-215]	Minneapolis	W. Simon	46	680	1	2	2	...
Mayo Foundation	Rochester, Minn.	H. P. Rome	47	860	...	4	16	175
Veterans Admin. Hospital—Gulfport Division [1-3-217]	Biloxi, Miss.	L. G. Behan	31	1,408	12	3	8	...
University of Mississippi Medical Center [105]								
University Hospital [1]	Jackson, Miss.	F. J. Moore	..	300	...	4	12	250
Veterans Admin. Hospital [1-3]	Jackson, Miss.	P. O. Henker, III	..	342	...	..	..	...
Mississippi State Hospital [1]	Whitfield, Miss.	J. J. Head	..	7,957	90	6	6	300
Kansas City General Hospital No. 1 [1-3]	Kansas City, Mo.	M. E. Kirkpatrick	..	112	...	4	14	250
Barnes Hospital [1-3]	St. Louis	E. F. Gildea	10	1,111	2	13	28	50
St. Louis City Hospital [1-3-226]	St. Louis	G. [illegible]	..	2,473	4	10	22	234
St. Louis State Hospital [1-3]	St. Louis	L. [illegible]	..	3,281	48	7	24	350
Veterans Admin. Hospital [1-3]	St. Louis	B. A. [illegible]	48	245	...	3	9	...
Nebraska Psychiatric Institute [1-3]	Omaha, Neb.	C. Wittson	51	398	...	10	34	300
Veterans Admin. Hospital [1-3]	Omaha, Neb.	F. A. Majka	53	452	2	2	6	...
New Jersey State Hospital at Ancora [1-3]	Hammonton, N. J.	M. Mendelson	..	3,537	174	3	7	541
Veterans Admin. Hospital [1-3]	Lyons, N. J.	L. S. Freeman	54	2,468	31	4	9	...
New Jersey State Hospital [1-3]	Marlboro, N. J.	J. B. Gordon	..	4,386	124	2	4	540
New Jersey State Hospital [1-3]	Trenton, N. J.	H. S. Magee	10	5,281	86	5	15	535
Albany Hospital [1-3]	Albany, N. Y.	W. L. Holt	..	1,366	10	3	11	250
Veterans Admin. Hospital [1-3-215]	Albany, N. Y.	T. H. Gilmore	..	[illegible]	2	3	5	...
Brooklyn State Hospital [1-3]	Brooklyn, N. Y.	N. Beckenstein	..	5,411	49	7	18	483
Kings County Hospital								
Division II [1-3]	Brooklyn, N. Y.	D. Engelhardt	..	9,476	31	10	30	155
Veterans Admin. Hospital [1-3]	Brooklyn, N. Y.	J. Barasch	57	226	2	1	5	...
Buffalo State Hospital [1-3]	Buffalo	D. Whitehead	..	5,079	66	3	9	450
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	S. M. Small	..	2,951	25	3	9	322
Central Islip State Hospital [1-3]	Central Islip, N. Y.	F. J. O'Neill	..	11,767	338	12	25	487
Marcy State Hospital [1-3-276]	Marcy, N. Y.	N. Bigelow	..	2,962	68	7	7	449
Middletown State Homeopathic Hospital [1-3]	Middletown, N. Y.	H. Pleasure	..	4,871	111	4	8	487
Veterans Admin. Hospital [1-3-257]	Montrose, N. Y.	G. Rosenberg	61	2,222	45	5	9	...
Bellevue Hospital Center								
Div. III—New York University								
College of Medicine [276]	New York City	S. B. Wortis	58	18,566	120	17	53	165
Bronx Municipal Hospital Center [1-3]	New York City	M. Rosenbaum	..	610	...	12	44	157
Columbia-Presbyterian Medical Center		L. C. Kolb	..	......	...	..	..	...
New York State Psychiatric Institute [1-3]	New York City	....	..	362	1	4	4	270
Presbyterian Hospital [1]	New York City	....	..	.....	...	..	4	250
Manhattan State Hospital [1-3-276]	New York City	J. H. Travis	59	4,988	111	13	13	487
New York Hospital [1-3]	New York City	O. Diethelm	..	314	...	5	15	179
St. Luke's Hospital [1-3]	New York City	J. M. Cotton	..	382	1	1	3	100
St. Vincent's Hospital [1-3]	New York City	H. J. Tompkins	..	571	...	3	10	200
Veterans Admin. Hospital (Bronx) [1-3]	New York City	W. Brown	60	1,104	4	10	22	...
Veterans Admin. Hospital (Manhattan) [1-3-265]	New York City	R. E. Peck	..	806	11	8	22	...
Veterans Admin. Hospital [1-3]	Northport, N. Y.	H. Tanner	..	3,109	27	4	6	...
Rockland State Hospital [1-3-288]	Orangeburg, N. Y.	A. M. Stanley	10	9,604	103	6	36	487
Hudson River State Hospital [1-3]	Poughkeepsie, N. Y.	R. C. Hunt	62	7,190	23	5	15	487
Creedmoor State Hospital [1-3-287]	Queens Village, N. Y.	H. A. La Burt	..	8,795	136	18	56	487
Rochester State Hospital [1-3-290]	Rochester, N. Y.	C. F. Terrence	64	5,219	51	3	7	487.50
Strong Memorial-Rochester								
Municipal Hospital [1-3-292]	Rochester, N. Y.	J. Romano	63	1,209	3	8	26	117
Ellis Hospital [1-3]	Schenectady, N. Y.	J. L. Best	..	1,453	3	2	3	150
State University of New York								
Upstate Medical Center Hospitals [1-3]	Syracuse, N. Y.	M. Hollender	..	749	5	6	18	233
Veterans Admin. Hospital [1-3]	Syracuse, N. Y.	W. A. Mann	..	370	...	4	6	...
Syracuse Psychiatric Hospital [1-3]	Syracuse, N. Y.	M. H. Hollender	66	514	...	4	4	487
Grasslands Hospital [1-3]	Valhalla, N. Y.	F. V. Rockwell	..	1,277	6	2	7	225
Pilgrim State Hospital [1-3]	West Brentwood, N. Y.	H. J. Worthing	..	16,007	350	20	40	470
New York Hospital—Westchester Division [1-3]	White Plains, N. Y.	J. H. Wall	..	733	4	6	14	150
North Carolina Memorial Hospital [1-3-298]	Chapel Hill, N. C.	G. C. Ham	..	687	1	12	42	260
Duke University Affiliated Hospitals								
Duke Hospital [1-3]	Durham, N. C.	E. W. Busse	..	404	2	6	20	200
Veterans Admin. Hospital [1-3]	Durham, N. C.	J. B. Parker, Jr.	..	373	...	1	6	...

Numerical and other references will be found on pages 640 through 642.

23. PSYCHIATRY—Continued

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered ^{8}	Total Residencies Offered ^{8}	Beginning Stipend (Month)
University of Cincinnati College of Medicine Hospital Group								
Cincinnati General Hospital $^{1-3}$	Cincinnati	M. Levine	69	862	3	14	42	200
Veterans Admin. Hospital $^{1-3}$	Cincinnati	H. Hiatt	..	365	...	..	14	...
Cleveland Receiving Hospital and State Institute of Psychiatry $^{1-3}$	Cleveland	E. N. Hinko	..	1,441	11	8	24	375
Western Reserve University Medical School Affiliated Hospitals								
University Hospitals $^{1-3}$	Cleveland	D. D. Bond	71	339	...	4	12	150
Veterans Admin. Hospital $^{1-3-318}$	Cleveland	J. Ross	71	201	...	1	3	...
Columbus State Hospital $^{1-3-320}$	Columbus, Ohio	R. L. Johnson	10	3,361	125	15	34	575
Ohio State University Hospitals								
Columbus Psychiatric Institute and Hospital $^{1-3-319}$	Columbus, Ohio	R. M. Patterson	10	840	...	12	28	375
Harding Sanitarium ^{1}	Worthington, Ohio	H. S. Evans	..	677	2	2	5	...
Central State-Griffin Memorial Hospital $^{1-3}$	Norman, Okla.	M. Wettstein	..	3,031	47	4	12	500
University of Oklahoma Medical Center			..	.....	...	10	26	...
University Hospital $^{1-3-325}$	Oklahoma City	L. J. West	..	57	...	..	..	...
Veterans Admin. Hospital ^{3}	Oklahoma City	J. T. Shurley	..	414	1	..	..	...
Danville State Hospital $^{1-3-338}$	Danville, Pa.	R. L. Gatski	..	3,337	19	7	26	404
Norristown State Hospital ^{1}	Norristown, Pa.	A. P. Noyes	..	5,430	98	7	30	588
Eastern Pennsylvania Psychiatric Institute $^{1-3}$	Philadelphia	J. E. Davis	..	326	3	2	10	312
Pennsylvania Hospital—The Institute and the Department for Mental and Nervous Diseases $^{1-3}$	Philadelphia	L. H. Smith	72	412	1	10	24	200
Philadelphia General Hospital $^{1-3}$	Philadelphia	W. Phillips	..	2,215	22	4	12	405
Philadelphia Psychiatric Hospital $^{1-3}$	Philadelphia	S. Cohen	..	1,286	...	5	15	167
Philadelphia State Hospital $^{1-3}$	Philadelphia	E. L. Sielke	..	7,479	48	12	36	586
Temple University Hospital $^{1-3-341}$	Philadelphia	O. S. English	74	101	...	6	22	...
Western Psychiatric Institute and Clinic $^{1-3}$	Pittsburgh	H. W. Brosin	75	434	1	15	45	267
Warren State Hospital $^{1-3}$	Warren, Pa.	R. H. Israel	..	4,641	120	12	30	585
Teaching Hospitals of the Medical College of South Carolina	Charleston, S. C.	J. J. Cleckley	..	771	3	1	2	137
Medical College Hospital			..	.....	...	..	..	...
Roper Hospital			..	.....	...	..	..	...
Gailor Memorial Psychiatric Hospital $^{1-3}$	Memphis, Tenn.	T. S. Hill	..	407	...	4	12	250
Vanderbilt University Hospital $^{1-3}$	Nashville, Tenn.	W. F. Orr	76	89	...	2	6	50
Parkland Memorial Hospital $^{1-3}$	Dallas, Texas	R. Stubblefield	10	188	...	3	8	300
Timberlawn Sanitarium	Dallas, Texas		..	.....	...	..	..	...
University of Texas Medical Branch Hospitals $^{1-3}$	Galveston, Texas	T. Harris	77	2,432	11	10	30	160
Baylor University College of Medicine Affiliated Hospitals								
Jefferson Davis Hospital $^{1-3}$	Houston, Texas	W. T. Lhamon	..	244	3	2	9	75
Methodist Hospital $^{1-3}$	Houston, Texas	M. C. Bettis	..	437	...	1	1	220
Veterans Admin. Hospital $^{1-3}$	Houston, Texas	A. D. Pokorny	78	1,441	5	6	18	...
University of Utah Affiliated Hospitals								
Salt Lake County General Hospital ^{3}	Salt Lake City	C. H. H. Branch	..	303	...	5	15	220
Veterans Admin. Hospital $^{1-3}$	Salt Lake City	M. P. Graeber	..	794	13	..	4	...
University of Virginia Medical Center Hospitals								
University of Virginia Hospital $^{1-3}$	Charlottesville, Va.	I. P. Stevenson	80	481	1	4	14	200
Medical College of Virginia—Hospital Division $^{1-3}$	Richmond, Va.	P. H. Drewry	..	750	3	2	5	75
Veterans Admin. Hospital $^{1-3}$	Richmond, Va.	A. Davis	82	791	3	2	4	...
University of Washington Affiliated Hospitals								
King County Hospital Unit No. 1 (Harborview) ^{1}	Seattle	H. S. Ripley	..	1,788	6	..	1	145
Veterans Admin. Hospital $^{1-3}$	Seattle	M. H. Johnson	83	323	3	4	12	...
University Hospitals $^{1-3}$	Madison, Wis.	R. Roessler	..	561	...	10	30	250
Veterans Admin. Hospital $^{1-3-363}$	Milwaukee (Wood), Wis.	M. J. Primakow	..	1,529	10	3	5	...
Hospital Hato Tejas $^{1-3}$	Bayamon, P. R.	R. Fernandez-Marina	..	467	...	6	15	250
Psychiatric Center for Training and Research	San Juan, P. R.	J. A. Rossello	..	181	...	6	6	...

Residency programs in the following hospitals have been approved for TWO years of training by the Council and the *American Board of Psychiatry and Neurology*, through the Residency Review Committee for Psychiatry and Neurology. (Applicants intending to qualify for examination by the American Board of Psychiatry and Neurology, Inc., should refer to the Board requirements that the candidate have had at least two of the three years of his training in a program or programs approved at the two or three year level—see summary of requirements American Board of Psychiatry and Neurology, Inc., page 686).

Hospitals, 51; Assistant Residencies and Residencies, 456

UNITED STATES NAVY

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered ^{8}	Total Residencies Offered ^{8}	Beginning Stipend (Month)
U. S. Naval Hospital $^{1-3}$	Oakland, Calif.	M. E. Roudebush	..	1,220	3	5	6	...
U. S. Naval Hospital $^{1-3}$	Philadelphia	J. F. McMullin	..	1,480	8	2	2	...

NONFEDERAL AND VETERANS ADMINISTRATION

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered ^{8}	Total Residencies Offered ^{8}	Beginning Stipend (Month)
Veterans Admin. Hospital ^{1}	Tuskegee, Ala.		..	.....	...	..	..	...
Herrick Memorial Hospital $^{1-3}$	Berkeley, Calif.	A. E. Bennett	..	558	...	1	6	300
Mount Zion Hospital $^{1-3}$	San Francisco	N. Reider	..	78	...	..	7	200
Stockton State Hospital	Stockton, Calif.	E. F. Galioni	..	2,524	146	3	9	415
District of Columbia General Hospital $^{1-3}$	Washington, D. C.	J. Schultz	..	4,473	2	3	3	258
George Washington University Hospital $^{1-3}$	Washington, D. C.	W. Overholser	..	865	1	..	2	175
Duval Medical Center $^{1-3}$	Jacksonville, Fla.	S. G. Bedell	..	670	3	2	5	175
Galesburg State Research Hospital $^{1-3}$	Galesburg, Ill.	T. T. Tourlentes	84	1,284	34	4	8	300
Veterans Admin. Hospital $^{1-3}$	Lexington, Ky.	E. W. Straus	31	1,894	31	1	1	...
Veterans Admin. Hospital $^{1-3}$	New Orleans	R. G. Heath	34	252	1	2	3	...
Seton Institute $^{1-3}$	Baltimore	L. H. Bartemeier	..	582	...	3	12	250
Springfield State Hospital $^{1-3}$	Sykesville, Md.	I. L. Hitchman	..	4,705	104	3	11	...
Beth Israel Hospital $^{1-3}$	Boston	G. L. Bibring	..	.....	..	..	10	167
New England Center Hospital $^{1-3}$	Boston	J. M. Hope	..	1,432	...	1	3	100
Medfield State Hospital $^{1-3}$	Medfield, Mass.	D. P. Kenefick	..	1,928	37	4	8	262
Metropolitan State Hospital ^{1}	Waltham, Mass.	M. Asekoff	..	2,999	74	2	4	255
Minneapolis General Hospital	Minneapolis	W. F. Sheeley	..	882	2	1	2	220
Homer G. Phillips Hospital $^{1-3}$	St. Louis	E. F. Gildea	..	371	...	2	6	201
Hastings State Hospital $^{1-3}$	Ingleside, Neb.	J. A. Wolford	52	2,349	45	4	8	400
Creighton Memorial-St. Joseph's Hospital	Omaha, Neb.	C. H. Farrell	..	804	4	2	6	210

Numerical and other references will be found on pages 640 through 642.

23. PSYCHIATRY—Continued

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered^{8}	Total Residencies Offered^{8}	Beginning Stipend (Month)
Essex County-Overbrook Hospital $^{1-3}$	Cedar Grove, N. J.	H. A. Davidson	..	4,208	91	6	18	445
New Jersey State Hospital $^{1-3}$	Greystone Park, N. J.	A. Crandell	..	7,335	141	2	6	540
New Jersey Neuro-Psychiatric Institute $^{1-3}$	Skillman, N. J.	R. E. Bennett	..	1,507	39	2	11	541
Binghamton State Hospital $^{1-3}$	Binghamton, N. Y.	U. Schutzer	..	4,684	45	5	5	487
Veterans Admin. Hospital $^{1-3-251}$	Canandaigua, N. Y.	D. Davis	65	2,098	35	3	6	...
Hillside Hospital $^{1-3}$	Glen Oaks, N. Y.	J. S. A. Miller	10	477	...	9	18	200
St. Vincent's Hospital $^{1-3}$	Harrison, N. Y.	R. D. Isernia	..	452	...	2	4	275
Gowanda State Homeopathic Hospital $^{1-3}$	Helmuth, N. Y.	I. M. Rossman	..	3,090	58	..	6	459
Kings Park State Hospital $^{1-3}$	Kings Park, N. Y.	C. Buckman	..	8,470	126	5	13	457
Mount Sinai Hospital $^{1-3}$	New York City	M. R. Kaufman	..	153	...	..	10	75
High Point Hospital $^{1-3}$	Port Chester, N. Y.	A. Gralnick	..	124	...	..	4	420
Utica State Hospital $^{1-3-296}$	Utica, N. Y.	B. B. Young	..	3,272	59	6	12	457
Willard State Hospital $^{1-3}$	Willard, N. Y.	K. Keill	..	3,688	87	4	9	457
Harlem Valley State Hospital $^{1-3}$	Wingdale, N. Y.	L. P. O'Donnell	55	6,675	74	11	11	467
State Hospital $^{1-3}$	Raleigh, N. C.	W. A. Sikes	..	4,487	64	4	8	438
Graylyn-North Carolina Baptist Hospital $^{1-3}$	Winston-Salem, N. C.	A. C. Randolph	..	384	...	2	9	166
Cleveland Clinic Hospital $^{1-3}$	Cleveland	G. H. Williams	70	286	...	1	3	175
Oregon State Hospital ^{1}	Salem, Ore.	H. L. Nelson	..	3,600	119	2	8	845
Allentown State Hospital $^{1-3}$	Allentown, Pa.	H. T. Fiedler	..	1,755	50	6	14	417
Veterans Admin. Hospital $^{1-3-337}$	Coatesville, Pa.	M. J. Gardner	73	2,048	40	4	12	...
Embreeville State Hospital $^{1-3}$	Embreeville, Pa.	E. R. Wright	..	1,592	44	6	9	550
Harrisburg State Hospital $^{1-3}$	Harrisburg, Pa.	H. C. Eaton	..	2,677	...	6	10	541
Mayview State Hospital	Mayview, Pa.	J. Solhaug	..	3,457	24	6	12	...
Friends Hospital $^{1-3}$	Philadelphia	T. L. Dehne	..	555	8	4	6	400
Hospital of the University of Pennsylvania $^{1-3}$	Philadelphia	K. Appel	..	21	...	8	20	200
State Hospital for Mental Diseases $^{1-3}$	Howard, R. I.	J. F. Regan	..	5,022	94	8	14	437
Austin State Hospital $^{1-3}$	Austin, Texas	S. Hoerster, Jr.	..	3,532	160	20	45	475
Eastern State Hospital $^{1-3}$	Williamsburg, Va.	J. E. Barrett	81	2,445	75	10	20	700
Milwaukee Sanitarium Foundation $^{1-3}$	Wauwatosa, Wis.	C. W. Osgood	..	507	4	3	3	400
Territorial Hospital $^{1-3-250}$	Kaneohe, T. H.	R. A. Kimmich	..	1,751	26	5	8	633

Residency programs in the following hospitals have been approved for ONE year of training by the Council and the American Board of Psychiatry and Neurology, through the Residency Review Committee for Psychiatry and Neurology. (Applicants intending to qualify for examination by the American Board of Psychiatry and Neurology, Inc., should refer to the Board requirements that the candidate have had at least two of the three years of his training in a program or programs approved at the two or three year level—see summary of requirements American Board of Psychiatry and Neurology, Inc., page 686).

Hospitals, 52; Assistant Residencies and Residencies, 199

UNITED STATES PUBLIC HEALTH SERVICE

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered^{8}	Total Residencies Offered^{8}	Beginning Stipend (Month)
National Institutes of Health—Clinical Center $^{1-3}$	Bethesda, Md.	R. Cohen	..	148	...	..	8	...
U. S. Public Health Service Hospital $^{1-3}$	Stapleton, S. I., N. Y.	E. W. Green	..	585	...	1	1	...

NONFEDERAL AND VETERANS ADMINISTRATION

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered^{8}	Total Residencies Offered^{8}	Beginning Stipend (Month)
Agnews State Hospital $^{1-3}$	Agnew, Calif.	W. Rapaport	..	7,738	125	3	3	415
Compton Sanitarium $^{1-3}$	Compton, Calif.	G. C. Burns	..	670	5	4	4	350
Napa State Hospital $^{1-3}$	Imola, Calif.	W. A. Oliver	..	8,750	241	2	2	415
Patton State Hospital ^{1}	Patton, Calif.	R. J. Lentz	..	7,324	115	2	2	415
Pacific State Hospital $^{1-3}$	Pomona, Calif.	G. Tarjan	..	3,052	38	..	3	415
Kaiser Foundation Hospital $^{1-3-4}$	San Francisco	B. I. Kahn	..	13	...	..	1	200
St. Mary's Hospital $^{1-3}$	San Francisco	M. T. Khlentzos-J. J. Preisinger	..	.....	...	..	..	...
Colorado State Hospital $^{1-3}$	Pueblo, Calif.	E. L. Durrill	..	7,858	85	12	24	415
Silver Hill Foundation ^{2}	New Canaan, Conn.	W. B Terhune	..	303	...	1	2	...
Children's Hospital $^{1-3}$	Washington, D. C.	R. S. Lourie	..	10	...	1	3	300
Grady Memorial Hospital ^{1}	Atlanta, Ga.	J. S. Skobba	..	315	...	1	1	250
Cook County Hospital	Chicago	V. G. Urse	..	7,692	4	3	6	250
North Shore Hospital $^{1-3}$	Winnetka, Ill.	S. Liebman	..	436	5	..	2	...
Dr. Norman M. Beatty Memorial Hospital	Westville, Ind.	....	..	.....	...	..	..	...
Crownsville State Hospital $^{1-3}$	Crownsville, Md.	L. D. Campbell	..	3,615	69	5	5	461
Chestnut Lodge Sanitarium $^{1-3}$	Rockville, Md.	D. M. Bullard	..	166	...	..	4	...
Peter Bent Brigham Hospital $^{1-3}$	Boston	H. M. Fox	..	Incl. in	Int. Med.	..	2	333
St. Elizabeth's Hospital $^{1-3}$	Boston	N. Flanagan	..	577	1	1	2	125
Foxborough State Hospital $^{1-3}$	Foxborough, Mass.	J. T. Shea	..	1,974	44	3	6	527
Austen Riggs Center $^{1-37}$	Stockbridge, Mass.	R. P. Knight	..	98	...	..	7	500
Taunton State Hospital $^{1-3}$	Taunton, Mass.	W. E. Glass	..	2,860	46	6	6	757
Westborough State Hospital $^{1-3}$	Westborough, Mass.	D. V. Capra	..	2,511	61	2	4	255
Hawthorn [illegible]	Northville, Mich.	R. D. Rabinovitch	10	97	...	5	5	540
Traverse City [illegible]	Traverse City, Mich.	M. D. Sommerness	..	4,192	64	6	18	541
Mississippi State Hospital ^{1}	Whitfield, Miss.	J. J. Head	..	7,357	90	6	6	300
St. Mary's Group of Hospitals $^{1-3}$	St. Louis	F. M. Grogan	50	641	7	1	1	100
New Hampshire State Hospital $^{1-3}$	Concord, N. H.	G. D. Niswander	..	3,577	47	2	6	312
Bergen Pines County Hospital $^{1-3}$	Paramus, N. J.	H. E. Lederer	..	1,234	6	1	1	200
River Crest Sanitarium $^{1-3}$	Astoria, N. Y.	M. Dolin	..	1,022	2	..	1	350
Meadowbrook Hospital $^{1-3}$	Hempstead, N. Y.	R. R. Steen	..	1,554	25	1	1	225
Lenox Hill Hospital $^{1-3-22}$	New York City	K. F. Woodward	..	.....	...	..	1	400
New York University-Bellevue Medical Center University Hospital ^{205}	New York City	S. B. Wortis	38	60	...	..	4	105
Roosevelt Hospital ^{1}	New York City	R. W. Laidlaw	..	104	...	2	4	133
St. Lawrence State Hospital $^{1-3}$	Ogdensburg, N. Y.	H. B. Snow	..	2,778	59	5	5	457
Astor Home for Children $^{1-3}$	Rhinebeck, N. Y.	....	..	51	...	..	2	...
Letchworth Village ^{1}	Thiells, N. Y.	I. N. Wolfson	..	.....	25	3	3	457
Longview State Hospital $^{1-3}$	Cincinnati	D Goldman	..	3,217	116	3	6	278
St. Charles Hospital $^{1-3}$	Toledo, Ohio	J. M. Kenyon	..	948	...	2	2	450
Abington Memorial Hospital $^{1-3}$	Abington, Pa.	E. T. Ayer	..	276	3	..	4	250
Albert Einstein Medical Center $^{1-3}$	Philadelphia	P. Sloane	..	.....	...	..	3	175
Jefferson Medical College Hospital $^{1-3}$	Philadelphia	B. L. Keyes	..	97	...	2	2	100
Veterans Admin. Hospital $^{1-3}$	Philadelphia	M. Cohen	..	231	1	1	1	...
St. Francis General Hospital and Rehabilitation Institute $^{1-3}$	Pittsburgh	J. A. Malcolm	..	5,061	41	4	4	225

Numerical and other references will be found on pages 640 through 642.

23. PSYCHIATRY—Continued

Name of Hospital	Location	Chief of Service	Program Identification	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
Charles V. Chapin Hospital [1-3]	Providence, R. I.	W. N. Hughes	..	1,045	6	2	2	456
Emma Pendleton Bradley Hospital [1-3]	Riverside, R. I.	M. W. Laufer	..	60	...	..	3	283
Brattleboro Retreat [1-3]	Brattleboro, Vt.	R. A. Kenworthy, III	..	1,190	1	2	6	458
Vermont State Hospital [3]	Waterbury, Vt.	R. A. Chittick	..	1,766	30	2	4	400
Pinel Foundation [1-3]	Seattle	R. H. Dickinson	..	82	...	..	2	400
Mendota State Hospital [1-3]	Madison, Wis.	G. B. Tybring	..	2,402	22	3	6	608
Queen's Hospital [1-3-35a]	Honolulu, T. H.	K. Rusch	..	574	1	1	3	150

PSYCHIATRY PROGRAM IDENTIFICATION

10. Service in child psychiatry.
11. Six months service at Los Angeles County Hospital, Los Angeles.
12. Nine months service at Mount Zion Hospital, six months at Langley Porter Clinic and service in child psychiatry, San Francisco.
13. Three months of service at Napa State Hospital, San Francisco Hospital, Stockton State Hospital, Sonoma State Home and San Quentin Prison; and six months at Colwell Memorial Hospital.
14. Three months service at Fort Miley Veterans Administration Hospital, San Francisco, and Langley Porter Clinic, San Francisco; may nclude elective services at University of California Hospital, Mount Zion Hospital and Stanford University (Lane) Hospital, San Francisco.
15. Three months service at Pacific Colony Hospital, Pomona, and three months service in child psychiatry at Camarillo State Hospital.
16. Affiliate services at Colorado General and Denver General Hospitals.
17. Affiliate service at Veterans Administration Hospital, West Haven, Connecticut State Hospital, Fairfield State Hospital, Norwich State Hospital and service in child psychiatry.
18. Twelve months service at Grace-New Haven Community Hospital, New Haven, Connecticut.
19. Six months service at Governor Bacon Health Center, Delaware City.
20. Two months service at George Washington University Hospital, Washington, D. C.
21. Affiliate service at University Hospital, Augusta, Georgia.
22. [illegible] he Neuropsychiatric Institute of the Uni- [illegible]; service in child psychiatry.
23. [illegible] service including service at the Neuropsychiatric Institute of the University of Illinois and three months in child psychiatry.
24. Affiliate service in Neuropsychiatric Institute of the University of Illinois and service in child psychiatry.
25. Three months service at Veterans Administration Hospital, Downey, Illinois, and service in child psychiatry.
26. Six months service at Veterans Administration Hospital, Hines, Illinois. May include service in child psychiatry.
27. Six months service in child psychiatry.
28. Integrated program including service at Veterans Administration Hospital, Indianapolis General Hospital and Indiana University Medical Center and Affiliated Hospitals, Indianapolis.
29. Integrated program including service at Veterans Administration Hospital, Menninger Sanitarium and Topeka State Hospital, Topeka, Kansas.
30. *Four months service at University of Louisville Services, Louisville, Kentucky,* and four months service at Cincinnati General Hospital, Cincinnati, Ohio.
31. Three months service at University of Louisville Services, Louisville, Kentucky.
32. Twelve months service at University of Louisville Services. May include four months service at Central State Hospital; four months service at Louisville General Hospital.
33. Four months service at Central State Hospital and service in child psychiatry.
34. Integrated program including service at Tulane University Unit, Charity Hospital, New Orleans, and Veterans Administration Hospitals, New Orleans, and Biloxi, Mississippi.
35. Six months service in child psychiatry and twelve months service at South Louisiana State Hospital.
36. Service in child psychiatry.
37. Three months service in child psychiatry at Johns Hopkins Hospital (Harriet Lane House), Baltimore, Maryland.
38. Twelve months service at Boston State Hospital and service in child psychiatry.
39. Twelve-eighteen months service at Veterans Administration Hospital, Boston (Jamaica Plain), Massachusetts, and six months service in child psychiatry.
40. Integrated program including service at Massachusetts General Hospital and McLean Hospital, Waverly; may include 1 year training in child psychiatry at James Jackson Putnam Children's Center.
41. Twelve months service at University Hospital, Ann Arbor, Michigan.
42. University Hospital, Ann Arbor, Michigan.
43. Three months service at Coldwater State Home and Training School, Caro State and Ionia State Hospitals and service in child psychiatry.
44. Six months service in child psychiatry at Children's Hospital, Detroit.
45. Six months service at Receiving Hospital, Children's Hospital, Detroit, and Wayne County General Hospital and Infirmary, Eloise, Michigan.
46. University of Minnesota Hospitals, Minneapolis, Minnesota.
47. Three months service at Rochester State Hospital, Rochester, Minn.
48. Affiliate service at Barnes Hospital, St. Louis and three months at St. Louis State Hospital.
49. Six months service at Barnes Hospital, St. Louis, Missouri.
50. Service at St. Louis State Hospital and St. Louis City Hospital.
51. Service at Lutheran Hospital, Omaha.
52. Service at University of Nebraska Hospital.
53. Affiliate service at University of Nebraska Hospital and Creighton Memorial-St. Joseph Hospital, Omaha, Nebraska.
54. Six months service at Newark City Hospital; three months at New Jersey State Hospital and three months in child psychiatry.
55. Three months service at Albany Hospital, Albany, New York.
56. Affiliate services at Edward J. Meyer Memorial Hospital and Buffalo State Hospital.
57. Six months service at King's County Hospital, Brooklyn, New York.
58. Integrated program with service at Bellevue Hospital Center and University Hospital.
59. Six months service at Mount Sinai Hospital, New York City.
60. Service in child psychiatry. May include six months service at Mount Sinai Hospital and three months at Manhattan State Hospital.
61. Twelve months service at New York Hospital and four months at Veterans Administration Hospital, New York City (Bronx), New York
62. Three months service at Grasslands, Rockland State, Albany Hospitals and Letchworth Village.
63. Six months service at Rochester State Hospital, Rochester, New York.
64. Six months service at Strong Memorial-Rochester Municipal Hospitals, Rochester.
65. Affiliate service at Strong Memorial-Rochester Municipal Hospitals.
66. Three months service at Syracuse Memorial, Binghamton, Syracuse and Willard State Hospitals, service at Craig Colony and service in child psychiatry.
67. Affiliate service at State Hospitals at Raleigh and Butner, North Carolina.
68. Eighteen months service at Duke Hospital, Durham, North Carolina.
69. Includes rotation through Central (Mental Hygiene) Clinic of the Community Chest, Child Guidance Home, Longview State Hospital, Jewish Hospital.
70. Integrated program including service at Cleveland Clinic and Windsor Hospital.
71. Integrated program including service at University Hospital and Veterans Administration Hospital, Cleveland, Ohio.
72. Integrated program with service at Institute of the Pennsylvania Hospital and Pennsylvania Hospital Department for Mental and Nervous Diseases.
73. Affiliate service at Temple University Hospital, Institute of Pennsylvania, Hospital of the Woman's Medical College of Pennsylvania.
74. Six months service at Philadelphia General Hospital and service in child psychiatry.
75. Two months affiliate service for institutional care.
76. Integrated program including service at Vanderbilt University Hospital, Veterans Administration Hospital, Nashville, Veterans Administration Hospital, Murfreesboro, and Central State Hospital, Nashville.
77. Four months affiliate service at St. Mary's Infirmary, Galveston, Texas.
78. Service in child psychiatry at Jefferson Davis Hospital, Houston, Texas.
79. Six months affiliate service at Veterans Administration Hospital, Salt Lake City, Utah, and affiliate services at State Hospital, Provo, Utah.
80. Integrated program including service at University of Virginia Hospital, Charlottesville and Veterans Administration Hospital, Roanoke, Va.
81. Affiliate service at Southwestern State Hospital, Marion and Lynchburg State Colony, Lynchburg, Va.
82. Six months service at Medical College of Virginia—Hospital Division, Richmond, and service in child psychiatry.
83. Six months service at Veterans Administration Hospital, American Lake, Washington, and six months in child psychiatry.
84. Illinois Mental Health Service program under the direction of the Illinois State Psychopathic Institute.

Numerical and other references will be found on pages 640 through 642.

24. PULMONARY DISEASE

Residency programs in the following hospitals have been approved for ONE year of training by the Council and the Subspecialty Board for Pulmonary Disease of the American Board of Internal Medicine, as offering acceptable training in the specialty.

Hospitals, 115; Assistant Residencies and Residencies, 363.

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
UNITED STATES ARMY							
Fitzsimons Army Hospital [1-3]	Denver	J. A. Wier	1,565	3	5	5	...
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE							
Freedmen's Hospital [1-3]	Washington, D. C.	H. M. Payne	134	7	..	1	308
NONFEDERAL AND VETERANS ADMINISTRATION							
Maricopa County General Hospital [1-3]	Phoenix, Ariz.	B. L. Snyder	246	1	1	1	300
City of Hope Medical Center [1-3]	Duarte, Calif.	L. Tepper	361	16	1	1	400
Barlow Sanatorium [1-3]	Los Angeles	H. W. Bosworth	228	3	1	1	200
Los Angeles County Hospital [1]	Los Angeles	H. Gierson	1,279	61	..	1	246
Bret Harte Sanatorium [1-3]	Murphys, Calif.	L. M. Barber	519	6	2	2	500
San Diego County General Hospital [1-3]	San Diego, Calif.	B. J. Comer	258	6	1	3	250
San Francisco Hospital							
Stanford University Service [1]	San Francisco	J. Kieran	769	8	..	1	205
University of California Service [1]	San Francisco	S. Farber	770	33	1	3	205
Santa Clara County Hospital [1-3]	San Jose, Calif.	R. M. Manson	242	7	..	1	502
Fairmont Hospital of Alameda County [1-3-88]	San Leandro, Calif.	W. B. Leftwich	285	10	1	1	200
Tulare-Kings Counties Hospital [1-3]	Springville, Calif.	W. A. Winn	472	19	3	3	600
National Jewish Hospital [1-3]	Denver	S. H. Dressler	704	12	9	9	250
University of Colorado Medical Center							
Colorado General Hospital [1-3]	Denver	R. S. Mitchell	98	1	..	2	160
Denver General Hospital [1-3]	Denver	G. Meiklejohn	174	4	..	..	...
Cedarcrest Hospital [1-3]	Newington, Conn.	R. C. Edson	577	16	1	1	335
Uncas-on-Thames [1-3]	Norwich, Conn.	N. L. Cressy	811	32	3	3	350
Laurel Heights Hospital [1-3]	Shelton, Conn.	K. S. Howlett, Jr.	670	29	2	2	205
Veterans Admin. Hospital [1-3]	West Haven, Conn.	N. D. Esopo	630	22	..	4	...
District of Columbia General Hospital [1-3]	Washington, D. C.	S. Katz	499	51	2	4	233
George Washington University Hospital [1-3]	Washington, D. C.	B. Blades	401	12	..	..	...
Southeast Florida Tuberculosis Hospital	Lantana, Fla.	M. Kovnat	478	20	2	2	200
Chicago State Tuberculosis Sanitarium [1-3]	Chicago	M. M. Pyle	782	23	1	2	350
City of Chicago Municipal Tuberculosis Sanitarium [1-3]	*Chicago*	*L. H. Berard*	2,833	62	2	2	185
Cook County Hospital-Oak Forest							
Tuberculosis Hospital [1-3]	Chicago	G. Holmes-G. Turner	2,128	30	3	4	140
Michael Reese Hospital [1-3]	Chicago	D. Radner	902	23	1	3	125
Mount Vernon State Tuberculosis Sanitarium	Mount Vernon, Ill.	H. C. Rogers	254	2	2	2	479
Peoria Municipal Tuberculosis Sanitarium [1-3]	Peoria, Ill.	D. Morse	136	2	1	2	250
Healthwin Hospital [1]	South Bend, Ind.	E. W. Custer	239	3	1	1	500
University of Kansas Medical Center [1-3-48]	Kansas City, Kan.	M. Fitz Patrick	240	10	..	1	125
Veterans Admin. Hospital [1-3]	*Kansas City, Mo.*	C. E. Andrews	Incl. in Int. Med.		..	..	...
Charity Hospital of Louisiana							
Louisiana State University Unit [1]	New Orleans	W. R. Akenhead	223	10	..	2	175
Central Maine Sanatorium [1-3-180]	Fairfield, Maine	W. B. Grow	181	11	1	1	75
Veterans Admin. Hospital	Baltimore	R. C. Duvall	648	26	..	..	...
Glenn Dale Hospital [1-3]	Glenn Dale, Md.	D. Goldenberg	1,121	24	6	6	338
Boston Sanatorium [1-3]	Boston	J. A. Foley	962	16	1	5	223
Cambridge Sanatorium [1-3]	Cambridge, Mass.	R. Kurzmann	269	6	1	1	540
Veterans Admin. Hospital [1-3]	Rutland Heights, Mass.	S. T. Allison	1,291	29	..	1	...
Middlesex County Sanatorium [1-3]	Waltham, Mass.	H. W. Evarts	427	8	1	1	607
Westfield State Sanatorium [1-3]	Westfield, Mass.	J. M. Houser	222	11	3	3	527
Worcester County Sanatorium	Worcester, Mass.	H. J. Lorge	232	21	3	3	...
Henry Ford Hospital [1-3]	Detroit	E. O. Coates, Jr.	498	15	1	3	250
Herman Kiefer Hospital [1-3]	Detroit	P. T. Chapman	2,564	110	9	11	554
Michigan State Sanatorium [1-3]	Howell, Mich.	W. F. Fidler	764	1	4	4	927
Wm. H. Maybury Sanatorium [1-3]	Northville, Mich.	W. L. Howard	1,786	23	5	5	555
Veterans Admin. Hospital [1-3]	Minneapolis	F. M. MacDonald	435	47	1	1	...
Nopeming Sanatorium [1-3]	Nopeming, Minn.	R. W. Beckus	653	13	..	1	150
Glen Lake Sanatorium [1-3]	Oak Terrace, Minn.	R. H. Frost	737	19	3	3	308
Mayo [illegible]	Rochester, Minn.		Incl. in Int. Med.		..	..	175
Mississippi [illegible] [1-3]	Sanatorium, Miss.	C. A. Watkins	986	5	2	2	600
Robert [illegible]	Koch, Mo.	B. Friedman	1,225	19	5	13	351
Missouri State Sanatorium [1-3]	Mount Vernon, Mo.	J. L. Yates	1,515	46	3	3	333
St. Mary's Group of Hospitals [1-3]	St. Louis	G. O. Broun	261	10	1	1	100
Veterans Admin. Hospital [1-3]	East Orange, N. J.	M. K. Small	734	8	..	2	...
New Jersey Sanatorium for Chest Diseases [1-3]	Glen Gardner, N. J.	J. A. Smith	554	8	5	5	535
B. S. Pollak Hospital for Chest Diseases [1-3]	Jersey City, N. J.	S. Cohen	888	42	9	9	166
Bergen Pines County Hospital [1-3]	Paramus, N. J.	R. R. Little	462	43	2	2	200
Essex County Sanatorium [1-3]	Verona, N. J.	I. Ocheret	704	20	3	5	500
Veterans Admin. Hospital	Albuquerque, N. M.	J. W. Berry	1,022	36	1	1	...
Albany Hospital [1-3]	Albany, N. Y.	F. C. Maxon	261	14	2	2	100
Kings County Hospital							
Division I [1-3]	Brooklyn, N. Y.	C. C. Hamilton	Incl. in Int. Med.		1	2	105
Division II [1-3]	Brooklyn, N. Y.	H. Lyons	Incl. in Int. Med.		1	2	105
Veterans Admin. Hospital [1-3]	Brooklyn, N. Y.	H. L. Katz	431	40	1	1	...
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	D. R. McKay	519	15	..	1	331
Elmhurst General Hospital [1-3]	Elmhurst, N. Y.	S. Bassin	177	3	1	1	105
Nassau County Tuberculosis Hospital [1-3]	Farmingdale, N. Y.	J. G. Carlton	498	15	5	5	...
Triboro Hospital [1-8]	Jamaica, N. Y.	H. H. Epstein	1,308	11	12	12	157
Ulster County Tuberculosis Hospital [1-8]	Kingston, N. Y.	H. F Schwartz	131	3	..	1	372
Niagara Sanatorium [1-8]	Lockport, N. Y.	L. C. Evander	301	17	1	2	343
Mount Morris Tuberculosis Hospital [1-8]	Mount Morris, N. Y.	F. L. Armstrong	557	9	2	2	537
Bellevue Hospital Center—							
Div. I—Columbia University [1-8]	New York City	J. H. McClement	1,781	53	18	26	157
Bronx Municipal Hospital Center [1-3]	New York City		713	21	10	10	125
Montefiore Hospital [1-3]	New York City	R. Bloch	433	22	..	5	157
Morrisania City Hospital [1-8]	New York City	P. Hurwitz	Incl. in Int. Med.		1	1	105
New York University—Metropolitan Medical Center							
Metropolitan Hospital [1-8]	New York City	I. G. Epstein	764	19	7	7	105

Numerical and other references will be found on pages 640 through 642.

24. PULMONARY DISEASE—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
St Joseph's Hospital for Chest Diseases [1-3]	New York City	F J McCarthy	580	20	4	4	250
Veterans Admin Hospital (Bronx) [1-3]	New York City	D Stone	1,115	50	1	3	...
[illegible] Hospital [1-3]	Oneonta, N Y	R Horton	586	10	2	3	537
	Perrysburg, N Y	R Nauen	182	13	2	2	594
	Ray Brook, N Y	F Beck	662	17	2	2	537
[1]	Rochester, N Y	W G Swalbach	487	18	2	5	435.50
	Schenectady, N Y	J M Blake	302	9	3	3	259
	Staten Island, N Y	E H Robitzek	3,000	67	27	27	157
Veterans Admin Hospital [1-3]	Sunmount, N Y	J W Raleigh	1,005	14	1	1	.
Onondaga Sanatorium [1-3]	Syracuse, N Y	B T Brown	522	12	1	1	537
Veterans Admin Hospital [1-3]	Syracuse, N Y	A D Renzetti, Jr	148	37	.	1	...
Grasslands Hospital [1-3]	Valhalla, N Y	W G Childress	484	17	2	7	225
Duke Hospital [1-3]	Durham, N C	E E Menefee	204	3	..	..	250
Veterans Admin Hospital [1]	Oteen, N C	W S Schwartz	1,946	59	.	6	...
Veterans Admin Hospital [2]	Brecksville, Ohio	R A Hemphill	620	15	1	1	...
Cuyahoga County Hospital [1-3]	Cleveland	R C McKay	803	32	5	5	162
Sunny Acres Cuyahoga County Tuberculosis Hospital [1-3]	Cleveland	H G Curtis	909	27	2	2	283
Ohio State University Hospitals			203	12	2	8	300
Ohio Tuberculosis Hospital [1-3]	Columbus, Ohio	R J Atwell					
University Hospital [1-3]	Columbus, Ohio	R H Browning	...	.	..	..	250
Eagleville Sanatorium [1-3]	Eagleville, Pa	J J Kirshner	377	5	3	3	.
Charles H Miner State Hospital [1-3]	Hamburg, Pa		973		2	2	416
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	H Israel	91	4	1	1	200
Hospital of the University of Pennsylvania [1-3]	Philadelphia	R Mayock	Incl in Int Med		2	3	..
Philadelphia General Hospital [1-3]	Philadelphia	W Weiss	727	49	1	2	352
Philadelphia General Hospital—Northern Division [1-3]	Philadelphia	R V Cohen	811	19	2	2	354
Samuel G Dixon State Hospital [1]	South Mountain, Pa	W A Gette	1,652	13	2	2	465
Oakville Memorial Sanatorium [1-3]	Memphis, Tenn	S C Carter	309	15	1	2	200
Veterans Admin Hospital [1-2]	Memphis, Tenn	S Phillips	835	18	1	1	..
West Tennessee Tuberculosis Hospital [1-2]	Memphis, Tenn	E P Bowerman	937	22	2	3	245
Veterans Admin Hospital [1-2]	Nashville, Tenn	R A Goodwin, Jr	304	10	1	3	...
Parkland Memorial Hospital [1-2]	Dallas, Texas	J O Armstrong	412	4	2	2	150
Baylor University College of Medicine Affiliated Hospitals							
Veterans Admin Hospital [1-3]	Houston, Texas	I Chofnas	1,726	45	1	1	.
Veterans Admin Hospital [1-2]	McKinney, Texas	D O Shields	651	11	1	2	...
Blue Ridge Sanatorium	Charlottesville, Va	C G Pearson	838	17	1	1	375
Veterans Admin Hospital [1-2]	Richmond, Va	W T Thompson, Jr	1,450	23	..	2	...
Firland Sanatorium [1-3]	Seattle	T F Sheehy, Jr	1,563	55	..	3	300
Veterans Admin Hospital [1]	Madison, Wis	J K Curtis	1,551	61	..	..	..
Muirdale Sanatorium	Milwaukee	A V Cadden	2,130	10	..	2	256
Veterans Admin Hospital [1-3]	Milwaukee (Wood), Wis	M W Garry-F B Landis	1,247	40	1	1	...
Leahi Hospital [1-3]	Honolulu, T H	H H Walker	847	16	2	2	350

25. RADIOLOGY

Residency programs in the following hospitals have been approved by the Council and the American Board of Radiology through the Residency Review Committee for Radiology. These programs are approved for THREE years of training in all phases of Radiology. All programs listed offer three years of training intramurally, or on an integrated basis, or through affiliation with another approved institution. Hospitals listed with the following symbol (±) are approved and offer training of three years intramurally, in addition to participating in an integrated residency program.

Hospitals, 371; Assistant Residencies and Residencies, 1,831

Name of Hospital	Location	Chief of Service	Number of X-Ray Examinations	Number of Radium Treatments	Number of Deep X-Ray Treatments	Number of Superficial X-Ray Treatments	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
UNITED STATES AIR FORCE									
U S Air Force Hospital	San Antonio, Texas	J M Keegan	110,112	10	871	184	2	6	...
UNITED STATES ARMY									
Letterman Army Hospital [1-3]	San Francisco	D Dullum	43,397	48	4,135	48	2	6	...
Fitzsimons Army Hospital [1-3]	Denver	P A Paden	64,143	18	3,256	389	2	6	...
Army Medical Center [1-3]	Washington, D C	J A Isherwood	67,124	292	9,722	419	3	9	...
Brooke Army Hospital [1-3]	San Antonio, Texas	A S Bauer	66,738	41	5,686	72	3	9	...
Tripler Army Hospital [1-3]	Honolulu, T H	H C Harrell	57,440	27	1,178	519	1	3	...
UNITED STATES NAVY									
U S Naval Hospital [1 3]	Oakland, Calif	L H Barber	34,452	13	1,878	209	3	5	...
U S Naval Hospital [1]	San Diego, Calif	J W Koett	84,023	41	6,450	105	4	17	...
U S Naval Hospital [1-3]	Bethesda, Md	S F Williams	40,564	8	3,042	203	2	4	...
U S Naval Hospital [1-3-184]	Chelsea, Mass	C E Bentel	20,232	10	730	268	1	1	...
U S Naval Hospital [1]	St Albans N Y	C Gartenlaub	57,662	2	3,526	42	2	5	...
U S Naval Hospital [1-3]	Philadelphia	N L Yood	94,501	15	1,527	70	3	7	...
UNITED STATES PUBLIC HEALTH SERVICE									
U S Public Health Service Hospital [1-3]	New Orleans	D Mackillop	27,924	...	.....	...	1	2	...
U S Public Health Service Hospital [1-3]	Baltimore	C R Walker	14,549	93	2,846	574	1	4	...
National Institutes of Health—Clinical Center [1-3]	Bethesda, Md	T Hilbish J R Andrews	29,840	14	2,481	...	1	3	...
U S Public Health Service Hospital [1-3-295]	Stapleton, S. I., N Y.	G. A. Shipman	36,790	...	2,163	478	2	8	...

Numerical and other references will be found on pages 640 through 642.

25. RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of X-Ray Examinations	Number of Radium Treatments	Number of Deep X-Ray Treatments	Number of Superficial X-Ray Treatments	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE									
Freedmen's Hospital [1-3]	Washington, D. C.	T. W. Davis	46,754	32	3,883	629	1	3	308
NONFEDERAL AND VETERANS ADMINISTRATION									
Birmingham Baptist Hospitals [1-3]	Birmingham, Ala.	J. W. Underwood	13,150	98	5,769	187	1	3	200
University of Alabama Medical Center									
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	J. G. Wood	39,140	126	9,916	611	3	12	108
Veterans Admin. Hospital [1-3]	Birmingham, Ala	B. Lieberman	30,074	67	1,936	21	..	2	...
University Hospital [1-3]	Little Rock, Ark.	D. M. Gould	31,735	45	3,794	234	4	12	155
Kern County General Hospital [1]	Bakersfield, Calif.	W. Leask	25,819	41	1,520	226	1	3	325
San Joaquin General Hospital [1]	French Camp, Calif.	A. Cove	50,303	20	2,021	...	1	1	260
Seaside Memorial Hospital [1-3]	Long Beach, Calif.	M. J. Prichard	19,593	82	7,884	609	1	4	185
Veterans Admin. Hospital [1-3]	Long Beach, Calif.	B. H. Feder	50,916	...	4,069	737	2	6	...
Cedars of Lebanon Hospital [1-3]	Los Angeles	D. Zion-H. Jaffe	23,931	23	4,069	...	2	6	265
Hospital of the Good Samaritan [1-3]	Los Angeles	J. D. Camp	33,935	17	4,851	131	2	2	225
Los Angeles County Hospital [1]	Los Angeles	G. Jacobson	110,581	332	10,940	913	4	13	246
Queen of Angels Hospital [1-3]	Los Angeles	L. Goin	16,434	41	1,924	74	1	1	200
University of California Hospital [1-3]	Los Angeles	A. H. Dowdy	31,745	67	16,600	1,122	3	10	229
Veterans Admin. Hospital [1-3-67]	Los Angeles	J. G. Davis	100,336	11	9,137	1,486	3	8	...
White Memorial Hospital [1-3]	Los Angeles	W. L. Stilson	14,345	86	3,553	324	2	5	215
Highland-Alameda County Hospital [1-3]	Oakland, Calif.	H. H. Jensen	30,500	48	2,230	...	1	3	200
Sutter Community Hospitals	Sacramento, Calif.	R. C. Ripple	17,076	60	13,361	2,846	1	2	248
San Diego County General Hospital [1-3]	San Diego, Calif.	E. L. Whitehead	18,783	20	1,581	146	1	3	250
Children's Hospital [1-3]	San Francisco	G. G. King	11,023	29	1,888	19	1	2	175
Mount Zion Hospital [1-3]	San Francisco	J. Levitin	15,563	23	1,566	...	1	2	150
St. Francis Memorial Hospital [1-3]	San Francisco	C. R. Fielder	20,097	26	3,676	1,193	1	1	300
St. Mary's Hospital [1-3]	San Francisco	C. Capp	21,258	24	2,101	159	1	3	200
San Francisco Hospital	San Francisco	L. H. Garland-A. J. Williams	19,500	12	1,134	...	2	3	205
Stanford University Hospitals [1-3]	San Francisco	H. S. Kaplan	17,421	28	6,828	1,008	2	5	100
Veterans Admin. Hospital [1-3]	San Francisco	H. S. Kaplan-R. S Stone	21,218	10	1,923	79	..	2	...
University of California Hospitals [3-78]	San Francisco	R S. Stone	57,079	89	11,375	518	5	16	231
Santa Clara County Hospital [1-3]	San Jose, Calif.	J. J. McCort	11,663	...	1,180	85	1	3	260
Harbor General Hospital [1]	Torrance, Calif.	J. H. Woodruff	34,668	97	2,361	389	3	9	246
Glockner-Penrose Hospital [1-3]	Colorado Springs, Colo.	J. C. McMullen-J. A. Del Regato	18,206	7	11,577	2,461	4	7	200
General Rose Memorial Hospital [1-3]	Denver	J. H. Weiss-M. H. Levine	15,658	26	2,465	50	1	3	265
Presbyterian Hospital [1-3]	Denver	K. D. A. Allen	10,048	53	6,984	133	1	3	275
St. Joseph's Hospital [1-3]	Denver	E. J. Meister	14,400	355	1,441	...	1	3	200
St. Luke's Hospital [1]	Denver	W. P. Stampfli	12,336	15	2,420	...	1	3	225
University of Colorado Medical Center									
Colorado General Hospital [1-3]	Denver	R. R. Lanier	28,166	46	1,856	547	4	13	180
Denver General Hospital [1-3]	Denver	E. Salzman	36,220	25	1,201	75	..	..	179
Veterans Admin. Hospital [1-3-63]	Denver	A. L. Daywitt	[illegible]	53	4,102	610	3	6	...
Bridgeport Hospital [1-3]	Bridgeport, Conn.	J. J. Esposito	17,736	73	2,461	...	1	3	240
St. Vincent's Hospital [1-3]	Bridgeport, Conn.	R. Russo	23,270	98	1,194	76	1	3	300
Hartford Hospital [1-3-103]	Hartford, Conn.	R. T. Ogden	41,446	68	15,196	...	2	5	125
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	M. Kligerman	51,792	218	6,867	...	3	9	140
Hospital of St. Raphael	New Haven, Conn.	R. Shapiro	21,171	32	7,158	...	2	6	150
St. Mary's Hospital [1-3]	Waterbury, Conn.	K. R. Kaess	19,343	24	2,121	65	1	3	225
Waterbury Hospital [1]	Waterbury, Conn.	J. M. James	21,236	34	1,403	133	1	3	225
Veterans Admin. Hospital [1-3-100]	West Haven, Conn.	A. B. Skorneck	21,092	5	2,560	33	1	3	...
Delaware Hospital [1-3]	Wilmington, Del.	W. W. Lattomus	25,853	239	3,841	287	1	3	220
Doctors Hospital [1-3]	Washington, D. C.	F. O. Coe	19,645	63	6,247	840	1	2	250
Georgetown University Hospital [1-3-114]	Washington, D. C.	W. E. Baensch	23,708	19	4,933	222	3	8	210
George Washington University Hospital [1-3]	Washington, D. C.	W. Stanbro	25,813	8	7,042	41	2	6	150
Veterans Admin. Hospital [1-3]	Martinsburg, W. Va.	H. Litwer	18,383	2	873	38	1	1	...
Veterans Admin. Hospital [1-3-117]	Washington, D. C.	S. R. Bersack	15,259	4	1,297	26	1	3	...
Washington Hospital Center [1-3]	Washington, D. C.	R. M. Caulk	41,834	35	8,085	536	2	6	215
Jackson Memorial Hospital [1-3]	Miami, Fla.	R. E. Parks	77,919	96	6,386	425	2	6	75
Crawford W. Long Memorial Hospital [1-3]	Atlanta, Ga.	R. A. Elmer	19,186	70	3,334	68	1	3	285
Grady Memorial Hospital [1]	Atlanta, Ga.	H. S. Weens	48,029	63	8,269	269	2	6	100
Piedmont Hospital [1-3]	Atlanta, Ga.	E. G. Smith, Jr.	11,173	22	723	10	1	1	290
Veterans Admin. Hospital [1-3-122]	Atlanta, Ga.	S. Krantz	15,819	3	3,854	462	1	3	...
Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga.	R. Wigh	9,271	10	1,303	63	4	10	250
University Hospital [1]	Augusta, Ga.	S. W. Brown	20,613	20	1,644	19	..	1	200
Veterans Admin. Hospital [1-3]	Augusta, Ga.	S. M. Roberts	21,261	1	3,046	69	..	1	...
Emory University Hospital [1-3]	Emory University, Ga.	H. S. Weens	22,195	72	7,890	...	1	3	235
Augustana Hospital [1-3]	Chicago	D. S. Beilin	16,440	...	1,690	...	2	2	150
Columbus Hospital [3]	Chicago	F. Lake	18,120	28	.....	...	1	3	...
Cook County Hospital	Chicago	I. F. Hummon	117,275	142	23,298	1,623	2	17	200
Illinois Masonic Hospital [1-3]	Chicago	J. H. Gilmore	25,463	13	2,903	80	2	2	115
Mercy Hospital [1-3]	Chicago	W. Furey	21,954	92	8,260	190	1	3	200
Michael Reese Hospital [1-3]	Chicago	B. Levin-E. Uhlmann	38,140	1,759	11,244	87	4	9	125
Mount Sinai Hospital [1-3]	Chicago	J. Nadelhaft-E. Japha	33,007	34	13,079	623	2	6	225
Northwestern University Medical Center									
#Chicago Wesley Memorial Hospital [1-3]	Chicago	A. H. Cannon-W. T. Moss	44,697	...	3,013	89	2	4	125
Children's Memorial Hospital	Chicago	......	......	...	.....	...	..	..	...
#Passavant Memorial Hospital [1-3]	Chicago	R. B. Lewis	16,581	...	1,966	...	1	3	125
#Veterans Admin. Research Hospital [1-3]	Chicago	E. G. Warnick-W. T. Moss	45,000	44	4,659	136	3	9	...
#Evanston Hospital [1-3]	Evanston, Ill.	H. C. Burkhead-A. Hamann	31,127	46	10,091	694	1	3	225
Presbyterian-St. Luke's Hospital									
Presbyterian Hospital Division [1-3]	Chicago	F. H. Squire	47,053	47	3,054	709	2	6	125
St. Luke's Hospital Division [1-3]	Chicago	E. L. Jenkinson	34,469	10	4,117	25	2	6	125

Numerical and other references will be found on pages 640 through 642.

25. RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of X-Ray Examinations	Number of Radium Treatments	Number of Deep X-Ray Treatments	Number of Superficial X-Ray Treatments	First Year Residencies Offered [*]	Total Residencies Offered [*]	Beginning Stipend (Month)
Provident Hospital [1-3]	Chicago	W. P. Quinn	8,748	87	1,420	355	1	3	200
University of Chicago Clinics [1-3]	Chicago	P. C. Hodges	41,071	59	12,509	677	4	12	200
University of Illinois Research and Educational Hospitals [1-3]	Chicago	R. A. Harvey	54,684	66	8,058	1,243	3	9	140
Veterans Admin. West Side Hospital [1-3]	Chicago	S. A. Leader	17,876	...	.....	...	2	6	...
St. Francis Hospital [1]	Evanston, Ill.	A. C. Ledoux	36,052	16	1,996	498	1	2	210
Little Company of Mary Hospital [1-3]	Evergreen Park, Ill.	W. Furey	35,679	73	2,851	141	1	3	175
Veterans Admin. Hospital [1-3]	Hines, Ill.	F. L. Hussey	69,052	1,174	12,314	565	5	12	...
St. Francis Hospital	Peoria, Ill.	P. R. Dirkse	25,319	12	4,699	385	1	3	225
Rockford Memorial Hospital [1-3]	Rockford, Ill.	B. Roseberg	18,627	21	1,221	...	1	3	...
Carle Memorial Hospital [1-3-123]	Urbana, Ill.	C. Gianturco	23,294	48	2,535	294	1	3	250
Indiana University Medical Center Affiliated Hospitals									
±Indianapolis General Hospital [1-3]	Indianapolis	W. A. Tosick	46,742	58	3,463	120	1	3	205
±Indiana University Medical Center Hospital [1]	Indianapolis	J. A. Campbell	24,972	187	7,051	240	5	13	165
±Veterans Admin. Hospital [1-3]	Indianapolis	P. C. Harding	23,462	12	1,700	319	..	..	...
Methodist Hospital [1]	Indianapolis	H. C. Ochsner	50,456	75	2,980	2,801	1	3	278
Iowa Methodist Hospital [1-3]	Des Moines, Iowa	A. B. Phillips	17,267	19	1,268	239	1	2	200
Veterans Admin. Hospital [1-3-143]	Des Moines, Iowa	P. J. Trier	30,194	6	1,514	136	1	3	...
State University of Iowa Hospitals [1-3]	Iowa City	E. F. Van Epps	62,008	107	17,133	...	3	9	175
Veterans Admin. Hospital [1-3]	Iowa City	J. G. Baron	21,794	6	5,896	98	2	4	...
University of Kansas Medical Center [1-3]	Kansas City, Kan.	G. Tice	31,359	75	6,147	519	..	4	125
Veterans Admin. Hospital [1-3]	Kansas City, Mo.	M. F. Westfall	34,496	5	2,108	81	..	..	...
St. Francis Hospital [1-3]	Wichita, Kan.	J. R. Kline	20,850	75	797	170	1	3	275
St. Joseph Infirmary [1-3]	Louisville, Ky.	J. Love-S. Johnson	30,671	136	7,856	...	1	4	210
University of Louisville Medical Center									
Louisville General Hospital [1-3]	Louisville, Ky.	E. L. Pirkey	44,482	36	3,471	50	3	9	83
Veterans Admin. Hospital [1-3]	Louisville, Ky.	J. F. Shaw	44,775	4	1,121	161	2	4	...
Charity Hospital of Louisiana [1]	New Orleans	A. Mayoral-M. Garcia	174,775	383	45,732	2,624	5	14	100
Hotel Dieu-Sister's Hospital	New Orleans	H. M. Duhe	18,915	33	2,201	313	1	3	225
Ochsner Foundation Hospital [1-3]	New Orleans	E. H. Little	57,150	112	4,234	109	2	6	225
Southern Baptist Hospital [1]	New Orleans	L. J. Bristow, Jr.	29,035	11	5,526	734	1	3	225
Touro Infirmary [1]	New Orleans	A. Payzant	35,699	28	2,393	...	1	3	125
Veterans Admin. Hospital [1-3-159]	New Orleans	C. P. Oderr	24,931	6	6,839	203	1	3	...
Confederate Memorial Medical Center [1]	Shreveport, La.	P. Riley	38,775	84	10,788	605	2	6	125
Eastern Maine General Hospital [1-3]	Bangor, Maine	H. A. Smith	22,188	23	1,784	318	1	2	125
Central Maine General Hospital [1]	Lewiston, Maine	C. F. Miller	11,370	11	1,997	82	..	1	225
Maine Medical Center [1]	Portland, Maine	J. F. Gibbons	26,632	69	3,047	146	1	2	125
Baltimore City Hospitals [1-3]	Baltimore	J. De Carlo	27,669	6	737	110	2	4	75
Johns Hopkins Hospital [1-3]	Baltimore	R. H. Morgan	65,707	197	11,449	...	4	16	160
Sinai Hospital [1-3]	Baltimore	J. O. Salik	22,250	22	685	...	2	4	110
University Hospital [1]	Baltimore	J. M. Dennis	49,235	179	7,150	386	2	7	75
Washington County Hospital [1]	Hagerstown, Md.	S. H. Macht	27,403	13	1,788	246	1	1	250
Beth Israel Hospital [1-3]	Boston	F. Fleischner	22,882	13	1,389	27	2	5	167
Boston City Hospital [1-3]	Boston	M. Ritvo	119,451	89	7,044	572	..	13	152
Lahey Clinic [1-3]	Boston	M. I. Smedal	69,356	10	8,570	1,484	5	5	200
Massachusetts General Hospital [1-3]	Boston	L. L. Robbins	77,933	194	11,411	3,534	4	12	67
Massachusetts Memorial Hospitals [1-3-172]	Boston	G. Levene	13,323	1	1,274	63	2	4	175
New England Center Hospital [1-3]	Boston	A. Ettinger	27,027	1	2,082	42	1	3	100
New England Deaconess Hospital [1-3]	Boston	J. H. Marks	22,405	40	5,091	70	1	4	200
Peter Bent Brigham Hospital [1-3-178]	Boston	J. B. Dealy, Jr.	27,737	19	1,790	47	4	12	42
Children's Medical Center	Boston	E. B. D. Neuhauser	23,000	...	2,419	...	..	5	...
Veteran		E. Wissing	38,955	...	2,981	125	2	6	...
Cambri		F. A. Herzan	16,040	10	643	...	1	2	160
Mount		R. Schatzki	......	...	.....	...	1	3	200
Mount Auburn Hospital [1-3]	Cambridge, Mass.	R. Schatzki	19,076	6	2,015	89	..	..	...
Faulkner Hospital [1-3]	Boston	L. E. Hawes	10,323	...	939	55	..	..	...
Lemuel Shattuck Hospital [1-3]	Boston	E. P. Strasser	7,239	16	4,500	53	..	..	...
St. Joseph Mercy Hospital [1-3]	Ann Arbor, Mich.	S. W. Donaldson	30,788	29	3,000	267	1	3	310
University Hospital [1-3-191]	Ann Arbor, Mich.	F. J. Hodges	58,258	157	13,784	502	6	18	160
Leila Y. Post Montgomery Hospital [1-3]	Battle Creek, Mich.	S. Barden	12,882	41	2,203	...	1	1	275
Grace Hospital [1-3]	Detroit	C. K. Hasley	40,043	33	5,061	1,128	2	6	275
Harper Hospital [1-3]	Detroit	L. Reynolds	27,246	230	17,658	178	3	9	275
Henry Ford Hospital [1-3]	Detroit	W. R. Eyler	84,384	160	10,604	220	4	12	250
Mount Carmel Mercy Hospital [1-3]	Detroit	J. M. Grace	50,480	30	3,465	138	2	4	275
Providence Hospital [1-3]	Detroit	W. A. Irwin	33,376	194	6,041	178	1	3	275
Sinai Hospital [1-3]	Detroit	H. Feigelson	15,741	10	2,900	15	1	2	275
Wayne State University Affiliated Hospitals									
Veterans Admin. Hospital [1-3-194]	Dearborn, Mich.	E. E. Levine	27,878	14	2,659	109	2	6	...
Detroit Memorial Hospital [1-3-198]	Detroit	J. E. Lofstrom	26,507	24	7,937	141	1	3	425
Herman Kiefer Hospital [1-3]	Detroit	H. E. Campbell	262,350	...	.....	...	2	2	534
Receiving Hospital [1-3-202]	Detroit	J. E. Lofstrom	94,861	82	6,451	453	6	18	303
Wayne County General Hospital and Infirmary [1-3]	Eloise, Mich.	J. Zbikowski	50,580	4	1,377	10	3	3	386
Hurley Hospital [1-3]	Flint, Mich.	D. R. Limbach	33,781	38	3,721	212	2	6	325
St. Joseph Hospital	Flint, Mich.		......	...	.....	...	..	..	...
Blodgett Memorial Hospital [1-3]	Grand Rapids, Mich.	H. C. Jones	18,200	26	4,171	34	1	3	300
Butterworth Hospital [1-3]	Grand Rapids, Mich.	E. C. Wahby	24,869	43	.....	566	1	3	300
St. Joseph Mercy Hospital [1-3]	Pontiac, Mich.	J. Morton	27,836	42	2,855	...	1	3	325
Swedish Hospital [1-3]	Minneapolis	L. G. Idstrom	34,448	31	3,049	...	1	2	200
University of Minnesota Hospitals [1-3-212]	Minneapolis	H. O. Peterson	61,617	223	13,507	939	6	10	209
Veterans Admin. Hospital [1-3-215]	Minneapolis	J. Jorgens	53,155	34	3,644	99	5	12	...
Mayo Foundation	Rochester, Minn.	H. M. Weber	262,628	1,225	30,477	1,872	8	26	175
Charles T. Miller Hospital [1-3]	St. Paul, Minn.		17,813	56,945	5,779	...	1	3	250
University Hospital [1]	Jackson, Miss.	R. Sloan	25,090	37	3,726	25	2	6	250
University of Missouri Medical Center [1-3]	Columbia, Mo.	G. S. Lodwick	10,227	11	1,862	60	2	6	200
Menorah Medical Center [1-3-220]	Kansas City, Mo.	D. S. Dann	14,238	21	792	132	1	3	300
Research and Affiliated Hospitals									
Veterans Admin. Hospital [1-3]	Wadsworth, Kan.	O. H. True	25,873	17	1,362	235	..	..	...
Children's Mercy Hospital	Kansas City, Mo.		......	...	.....	...	..	..	...
Kansas City General Hospital No. 2 [1-3]	Kansas City, Mo.	A. B. Smith	17,179	10	353	12	1	3	200
Research Hospital [1-3]	Kansas City, Mo.	A. B. Smith	18,313	63	1,920	5	4	12	250
Veterans Admin. Hospital [1-3]	Kansas City, Mo.	M. F. Westfall	34,496	5	2,108	81	..	..	...

Numerical and other references will be found on pages 640 through 642.

25. RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of X-Ray Examinations	Number of Radium Treatments	Number of Deep X-Ray Treatments	Number of Superficial X-Ray Treatments	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
St. Joseph Hospital [1-3]	Kansas City, Mo.	C. E. Virden	22,408	119	2,504	86	1	4	...
St. Luke's Hospital [1-3]	Kansas City, Mo.	L. A. Scarpellino	14,851	21	2,336	88	1	3	310
Barnes Hospital [1-3]	St. Louis	H. Wilson	59,164	347	11,011	...	5	15	150
De Paul Hospital [1-3]	St. Louis	E. C. Ernst	14,119	44	1,493	168	1	1	200
Homer G. Phillips Hospital [1-3]	St. Louis	W. E. Allen, Jr.	33,576	96	1,295	27	2	5	201
Jewish Hospital [1-3]	St. Louis	H. R. Senturia	20,975	47	4,975	407	1	3	150
St. Louis City Hospital [1-3-227]	St. Louis	D. C. Weir	44,648	44	3,454	90	2	7	234
St. Mary's Group of Hospitals [1-3]	St. Louis	L. Sante	31,240	48	3,499	174	1	3	100
Veterans Admin. Hospital [1-3]	St. Louis	S. [illegible]	20,333	22	6,125	81	2	6	...
Creighton Memorial-St. Joseph's Hospital	Omaha, Neb.	J. [illegible]	20,689	36	2,883	77	1	3	210
Nebraska Methodist Hospital [1-3]	Omaha, Neb.	H. B. Hunt	11,928	95	4,656	789	1	2	300
University of Nebraska Hospital [1-3]	Omaha, Neb.	H. B. Hunt	11,393	71	1,811	120	1	4	200
Veterans Admin. Hospital [1-3-234]	Omaha, Neb.	H. B. Salebek	23,128	...	1,686	41	1	3	...
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	L. K. Sycamore	32,164	101	3,533	749	2	6	218
Our Lady of Lourdes Hospital [1-3]	Camden, N. J.	B. P. Widmann	23,243	32	1,493	152	1	3	200
Veterans Admin. Hospital [1-3-236]	East Orange, N. J.	J. R. Nahon	23,538	1	2,779	102	1	3	...
Hackensack Hospital [1-3]	Hackensack, N. J.	E. J. Ryan	14,536	25	2,707	215	1	3	150
Jersey City Medical Center	Jersey City, N. J.	H. J. Perlberg	.....	...	.....	...	4	6	167
Newark Beth Israel Hospital [1-3]	Newark, N. J.	N. J. Furst-L. J. Levinson	15,000	37	3,698	135	1	3	100
Albany Hospital [1-3]	Albany, N. Y.	J. F. Roach	32,389	52	8,824	...	2	6	160
Veterans Admin. Hospital [1-3]	Albany, N. Y.	H. Thomas	32,401	1	2,220	28	1	2	...
Beth El Hospital [1-3-226]	Brooklyn, N. Y.	M. Dannenberg	17,191	77	1,834	...	1	3	150
Brooklyn Hospital [1-3]	Brooklyn, N. Y.	P. J. Lampros	22,746	47	2,715	155	1	3	175
Cumberland Hospital [1-3-252]	Brooklyn, N. Y.	E. Mendelson	23,419	13	659	60	1	2	105
Jewish Hospital [1-3]	Brooklyn, N. Y.	S. [illegible]	31,000	5,638	5,500	...	2	5	100
Kings County Hospital [illegible]	Brooklyn, N. Y.	H. [illegible]	151,068	260	20,075	290	4	13	105
Long Island College Hospital [1-3]	Brooklyn, N. Y.	R. L. [illegible]	23,687	20	2,969	50	1	4	156
Maimonides Hospital [1-3]	Brooklyn, N. Y.	E. J. Levin	32,805	14	1,823	53	1	3	75
Methodist Hospital [1-3]	Brooklyn, N. Y.	N. F. Burtone	21,067	18	61	1,496	1	3	175
Veterans Admin. Hospital [1-3-262]	Brooklyn, N. Y.	W. Schlein	28,043	8	4,212	231	2	3	...
Buffalo General Hospital [1-3]	Buffalo	G. J. Culver	29,373	55	5,456	420	2	4	175
Deaconess Hospital [1-3]	Buffalo	R. Seibel	15,845	19	4,283	105	..	1	300
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	E. G. Eschner	71,707	18	3,366	541	2	6	247
Millard Fillmore Hospital [1-3]	Buffalo	E. H. Schnap	28,948	...	862	90	1	3	285
Roswell Park Memorial Institute [1-3]	Buffalo	W. Murphy-F. Lessman	32,550	675	55,596	2,860	9	15	318
Veterans Admin. Hospital [1-3]	Buffalo	K. Flachs	28,952	...	2,940	116	1	2	...
Elmhurst General Hospital [1-3]	Elmhurst, N. Y.	P. Strax	24,747	...	533	59	2	4	105
Flushing Hospital and Dispensary [1-3-255]	Flushing, N. Y.	M. Pomeranz	15,592	13	411	3	1	3	175
Meadowbrook Hospital [1-3]	Hempstead, N. Y.	H. R. Zatzkin	35,118	36	8,644	509	1	3	225
Queens Hospital Center [1-3]	Jamaica, N. Y.	A. V. Shapiro-L. B. Goldman	61,777	63	5,169	1,041	2	6	105
Charles S. Wilson Memorial Hospital [1-3]	Johnson City, N. Y.	B. D. Jay	21,682	5	1,413	272	1	3	225
Long Island Jewish Hospital [1-3-258]	New Hyde Park, N. Y.	B. S. Epstein	18,006	4	1,644	51	1	3	100
Bellevue Hospital Center Div. III—New York University College of Medicine	New York City	M. Poppel	206,586	2,132	6,221	375	3	12	71
Beth Israel Hospital [1-3-266]	New York City	A. Geffen	18,384	16	3,916	210	1	4	155
Bronx Hospital [1-3]	New York City	A. J. Bernstein-J. R. Freid	23,190	10	3,109	133	1	3	100
Bronx Municipal Hospital Center [1-3]	New York City	M. Elkin	52,337	56	5,706	75	4	12	125
Francis Delafield Hospital [1-3]	New York City	W. Seaman	11,440	26	17,008	683	2	9	105
Hospital for Joint Diseases [1-3]	New York City	M. M. Pomeranz	26,004	18	7,332	136	1	3	80
Lenox Hill Hospital [1-3]	New York City	F. B. Ghiselin	23,977	20	3,209	59	1	3	240
Lincoln Hospital [1-3-258]	New York City	R. Feig	38,695	6	205	5	1	2	105
Memorial Center for Cancer and Allied Diseases [1-3]	New York City	R. S. Sherman-J. J. Nickson	66,588	472	.....	43,140	5	20	150
Morristown Memorial Hospital [1-3]	Morristown, N. J.	F. Reed, Jr.	15,400	9	1,855	259	1	1	250
James Ewing Hospital	New York City	....	......	...	.....	...	..	..	...
Memorial Hospital	New York City	....	......	...	.....	...	..	..	...
Montefiore Hospital [1-3]	New York City	H. Jacobson-C. Botstein	55,234	75	24,360	2,522	8	10	187
Morrisania City Hospital [1-3]	New York City	J. Fierstein-P. W. Cohen	23,748	34	1,909	298	2	2	105
Mount Sinai Hospital [1-3]	New York City	B. S. Wolf	45,309	89	6,404	...	3	7	75
New York Hospital [1-3]	New York City	J. A. Evans	91,421	107	8,980	1,042	6	20	164
New York Medical College—Metropolitan Medical Center									
‡Flower and Fifth Avenue Hospitals [1-3]	New York City	F. J. Borrelli	36,120	49	1,077	168	1	4	...
‡Metropolitan Hospital [1-3]	New York City	F. J. Borrelli	68,961	23	5,431	546	2	4	105
New York Polyclinic Medical School and Hospital [1]	New York City	W. H. Shehadi	11,874	36	1,318	927	1	3	125
New York University—Bellevue Medical Center University Hospital [265]	New York City	M. Poppel	18,188	49	1,455	1,918	2	5	105
Presbyterian Hospital [1]	New York City	W. B. Seaman	122,942	97	19,928	2,761	4	12	230
Roosevelt Hospital [1]	New York City	A. A. Dunn	49,488	3,762	2,719	157	2	6	133
St. Luke's Hospital [1-3]	New York City	H. F. Hempel	41,147	9	5,631	...	2	6	100
St. Vincent's Hospital [1-3]	New York City	F. F. Ruzicka, Jr.	40,093	21	3,926	144	3	7	125
Veterans Admin. Hospital (Bronx) [1-3]	New York City	J. Stein-B. Roswit	62,538	145	11,451	897	3	10	...
Veterans Admin. Hospital (Manhattan) [1-3]	New York City	L. R. Lawrence	41,675	157	2,461	108	3	6	...
Genesee Hospital [1-3]	Rochester, N. Y.	G. J. Baron	21,520	29	2,369	269	1	1	175
Rochester General Hospital [1-3-246]	Rochester, N. Y.	E. F. Merrill	37,038	72	5,097	992	1	3	125
St. Mary's Hospital [1-3]	Rochester, N. Y.	H. Forsyth	20,117	370	661	31	1	2	230
Strong Memorial-Rochester Municipal Hospital [1-3]	Rochester, N. Y.	G. H. Ramsey	32,890	35	372	32	3	10	117
State University of New York Upstate Medical Center [1-3]	Syracuse, N. Y.	C. Hale	45,826	79	5,680	180	2	6	233
Veterans Admin. Hospital [1-3]	Syracuse, N. Y.	E. R. Heitzman	18,143	1	963	12	1	3	...
Grasslands Hospital [1-3]	Valhalla, N. Y.	A. G. Debbie	......	...	.....	...	1	3	175
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	E. H. Wood	33,693	105	2,553	42	2	6	175

Numerical and other references will be found on pages 640 through 642.

25. RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of X-Ray Examinations	Number of Radium Treatments	Number of Deep X-Ray Treatments	Number of Superficial X-Ray Treatments	First Year Residencies Offered [6]	Total Residencies Offered [7]	Beginning Stipend (Month)
Duke University Affiliated Hospitals									
‡Duke Hospital [1-3]	Durham, N. C.	R. J. Reeves	73,272	133	5,679	381	5	12	102
Veterans Admin. Hospital [1-3]	Durham, N. C.	R. J. Reeves	28,574	10	1,329	20	1	2	...
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	I. Meschan	28,485	1	2,711	123	2	6	166
Bismarck Hospital [3]	Bismarck, N. Dak.	H. M. Berg	30,897	88	2,742	875	1	3	200
Akron City Hospital [1-3]	Akron, Ohio	F. T. Moore	50,891	268	7,198	209	1	4	250
Akron General Hospital [1]	Akron, Ohio	C. J. Miller	27,073	19	4,301	223	1	3	250
Aultman Hospital [1-3]	Canton, Ohio	S. Larson	28,794	35	3,200	547	1	3	275
Mercy Hospital [1-3]	Canton, Ohio	T. J. Dodd	12,998	21	4,275	...	1	2	200
University of Cincinnati College of Medicine Hospital Group									
Cincinnati General Hospital [1-3]	Cincinnati	B. Felson	52,174	86	5,630	168	4	14	85
Good Samaritan Hospital [1-3]	Cincinnati	J. E. McCarthy	32,295	54	5,040	14	1	2	250
Jewish Hospital [1-3]	Cincinnati	L. Rosenberg	24,776	78	2,490	177	1	3	195
Cleveland Clinic Hospital [1-3]	Cleveland	C. R. Hughes	49,939	30	7,456	210	3	9	175
Cuyahoga County Hospital [1-3]	Cleveland	H. Hauser	38,991	66	4,082	1,695	3	11	162
Huron Road Hospital [1-3]	Cleveland	W. D. Heinrich	30,882	29	461	241	1	3	210
Mount Sinai Hospital [1-3]	Cleveland	G. Krause-M. Lubert	27,979	20	4,401	...	1	3	215
St. Luke's Hospital [1-3]	Cleveland	D. D. Brannan	37,657	38	3,934	388	1	3	140
St. Vincent Charity Hospital [1-3]	Cleveland	E. J. O'Malley	29,058	10	1,550	...	1	2	210
University Hospitals [1-3]	Cleveland	H. L. Friedell	66,312	42	2,986	406	3	9	150
Veterans Admin. Hospital [1-3]	Cleveland	M. D. Sachs	36,785	7	1,996	89	2	8	...
Ohio State University Hospitals									
University Hospital [1-3]	Columbus, Ohio	S. W. Nelson	50,287	...	12,839	498	5	15	177
Miami Valley Hospital [1-3]	Dayton, Ohio	G. A. Nicoll	30,637	52	3,076	139	1	3	200
Veterans Admin. Hospital [1-3]	Dayton, Ohio	H. Plaut	34,026	1	1,077	82	..	1	...
Elyria Memorial Hospital [1-3]	Elyria, Ohio	D. C. Russell	18,567	5	501	99	..	1	270
St. Joseph Hospital	Lorain, Ohio	D. A. Russell	14,314	27	2,031	49	1	3	...
Mercy Hospital [1-3]	Toledo, Ohio	M. M. Thompson	20,686	37	.....	...	..	..	275
Youngstown Hospital [1-3]	Youngstown, Ohio	E. C. Baker	58,011	65	6,768	1,915	1	3	325
University of Oklahoma Affiliated Hospitals									
University Hospital [1-3]	Oklahoma City	G. R. Ridings	32,735	70	9,654	1,054	4	12	200
Veterans Admin. Hospital [3]	Oklahoma City	S. M. Glasser	36,756	2	2,782	249	1	4	...
Wesley Hospital	Oklahoma City	E. H. Kalmon	14,728	32	2,258	38	1	1	250
St. John's Hospital	Tulsa, Oklahoma	L. M. Pascucci	26,280	51	1,283	79	2	4	175
Providence Hospital [1-3]	Portland, Ore.	S. Rees	17,478	20	1,691	...	1	3	275
St. Vincent's Hospital [1-3]	Portland, Ore.	S. E. Rees	13,162	15	266	20	2	6	275
University of Oregon Medical School									
Hospitals and Clinics [1-3]	Portland, Ore.	C. T. Dotter	36,637	19	1,191	...	3	6	125
Abington Memorial Hospital [1-3]	Abington, Pa.	C. H. Sillars	27,398	56	2,547	849	1	3	150
Sacred Heart Hospital [1-3]	Allentown, Pa.	K. W. Taber-C. L. Mengel	13,688	613	5,569	550	1	3	225
Bryn Mawr Hospital [1-3]	Bryn Mawr, Pa.	R. M. Harvey	24,524	21	2,914	484	1	3	200
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	J. L. Williams	26,618	51	1,748	4,400	1	4	175
Thomas M. Fitzgerald Mercy Hospital	Darby, Pa.	F. K. Alexander	16,562	74	2,555	265	1	3	100
Hamot Hospital [1-3]	Erie, Pa.	R. D. Bacon	21,875	37	1,874	...	1	3	250
St. Vincent's Hospital [1-3]	Erie, Pa.	R. Bacon	18,195	24	1,008	21	1	3	200
Albert Einstein Medical Center									
Northern Division	Philadelphia	J. Gershon-Cohen	27,991	110	6,067	900	1	3	125
Southern Division [1-3]	Philadelphia	H. Isard	22,188	37	2,702	...	1	3	125
Chester County Hospital	West Chester, Pa.	......	......	...	.....	...	..	..	...
Chestnut Hill Hospital [1]	Philadelphia	R. P. Barden	12,046	8	1,512	182	1	2	250
Episcopal Hospital [1-3]	Philadelphia	H. Fisher	24,763	33	1,741	140	1	1	150
Germantown Dispensary and Hospital [1-3]	Philadelphia	B. R. Young	27,107	55	5,775	390	1	3	175
Graduate Hospital of the									
University of Pennsylvania [1-3]	Philadelphia	A. Finkelstein	22,307	53	2,715	308	4	8	100
Hahnemann Medical College and Hospital [1-3]	Philadelphia	J. S. Lehman	37,648	286	3,462	143	2	6	75
Hospital of the University of Pennsylvania [1-3]	Philadelphia	E. P. Pendergrass	168,159	82	14,952	3,267	6	24	...
Children's Hospital [1-3]	Philadelphia	J. W. Hope	11,095	6	224	31	1	1	250
Jeanes Hospital [1-3]	Philadelphia	E. P. Pendergrass	5,949	6	634	30	1	1	300
Hospital of the Woman's Medical									
College of Pennsylvania [1-3]	Philadelphia	J. Vastine	10,064	21	1,200	...	1	3	130
Jefferson Medical College Hospital [1-3]	Philadelphia	R. L. Nichols	39,642	118	12,388	84	4	12	150
Nazareth Hospital [1]	Philadelphia	J. S. Fetter	19,477	15	1,418	584	1	3	200
Pennsylvania Hospital [1-3]	Philadelphia	P. A. Bishop	21,136	93	2,101	261	2	2	100
Philadelphia General Hospital [1-3]	Philadelphia	B. Widmann	171,019	203	7,088	199	4	12	121
Presbyterian Hospital [1-3]	Philadelphia	E. L. Lame	12,633	67	2,131	30	1	3	175
Temple University Hospital [1-3]	Philadelphia	H. M. Stauffer	31,359	32	8,926	363	5	15	...
Veterans Adm'n. Hospital [1-3]	Philadelphia	G. T. Wohl	28,128	7	2,109	73	3	8	...
Allegheny General Hospital [1]	Pittsburgh	T. B. Childs	38,520	28	943	332	1	4	200
Mercy Hospital [1-3]	Pittsburgh	C. R. Perryman	28,778	67	17,510	...	2	6	235
Montefiore Hospital [1-3-347]	Pittsburgh	H. W. Friedman	17,374	...	2,322	175	1	3	225
Health Center Hospitals of the University of Pittsburgh School of Medicine									
Children's Hospital [1-3]	Pittsburgh	B. R. Girdany	23,906	...	.....	...	..	..	...
Elizabeth Steel Magee Hospital	Pittsburgh	C. N. Chasler	14,702	44	1,341	...	1	1	125
Presbyterian Hospital	Pittsburgh	E. C. Lasser	97,751	154	7,031	169	5	9	125
St. Francis General Hospital and									
Rehabilitation Institute [1-3]	Pittsburgh	G. Alexander	23,207	18	2,140	20	2	3	225
Veterans Admin. Hospital [1-3]	Pittsburgh	S. Lewis	25,720	34	4,283	110	1	4	...
Western Pennsylvania Hospital [3]	Pittsburgh	D. H. Rice-L. S. Sherman	31,670	60	2,225	822	1	3	225
Reading Hospital [1-3]	Reading, Pa.	G. W. Chamberlin	16,788	12	6,087	...	2	6	225
Robert Packer Hospital [1-3]	Sayre, Pa.	J. T. Littleton	31,699	25	3,662	180	1	3	225
Rhode Island Hospital [1-3]	Providence, R. I.	L. A. Martineau	32,961	50	2,080	225	1	3	125
Teaching Hospitals of the Medical College									
of South Carolina	Charleston, S. C.	H. S. Pettit	1,260	9	421	1	2	4	137
Medical College Hospital		......	......	...	.....	...	..	..	...
Roper Hospital		......	......	...	.....	...	..	..	...
Spartanburg General hospital [1]	Spartanburg, S. C.	H. E. Plenge	15,143	28	3,619	341	1	1	200
Baroness Erlanger Hospital [1-3]	Chattanooga, Tenn.	C. W. Reavis	26,514	31	7,934	356	1	3	250

Numerical and other references will be found on pages 640 through 642.

25. RADIOLOGY—Continued

Name of Hospital	Location	Chief of Service	Number of X-Ray Examinations	Number of Radium Treatments	Number of Deep X-Ray Treatments	Number of Superficial X-Ray Treatments	First Year Residencies Offered[8]	Total Residencies Offered[8]	Beginning Stipend (Month)
Baptist Memorial Hospital[1-3]	Memphis, Tenn.	J. E. Whiteleather	27,895	8	1,483	126	1	4	200
City of Memphis Hospitals[1-3]	Memphis, Tenn.	C. Heacock	43,924	78	5,957	205	2	6	150
Methodist Hospital	Memphis, Tenn.	J. C. King	27,081	57	5,030	421	2	6	220
Veterans Admin. Hospital[1-3-352]	Memphis, Tenn.	B. E. Greenberg	64,063	20	6,048	290	2	3	...
Vanderbilt University Hospital[1-3]	Nashville, Tenn.	H. C. Francis	29,233	91	84	922	3	7	50
Veterans Admin. Hospital[1-3]	Nashville, Tenn.	D. E. Sherman	23,515	1	1,651	122	1	3	...
Baylor University Hospital[1-3]	Dallas, Texas	J. E. Miller	32,005	117	10,163	130	2	7	175
Parkland Memorial Hospital[1-3]	Dallas, Texas	F. J. Bonte	41,542	59	3,823	1,723	3	5	150
St. Paul's Hospital[1-3]	Dallas, Texas	G. D. Carlson	15,864	57	1,913	...	1	3	150
Veterans Admin. Hospital[1-3]	Dallas, Texas	B. K. Lovell	20,411	48	2,725	1,073	3	7	...
University of Texas Medical Branch Hospitals[1-3]	Galveston, Texas	R. N. Cooley	68,998	96	6,473	18	3	9	160
Baylor University College of Medicine Affiliated Hospitals									
Jefferson Davis Hospital[1-3]	Houston, Texas	V. P. Collins	58,470	61	1,163	121	2	7	75
Methodist Hospital[1-3]	Houston, Texas	C. H. Burge	19,762	9	1,791	...	..	2	220
Veterans Admin. Hospital[1-3-355]	Houston, Texas	H. L. Burton	50,330	16	4,814	135	1	3	...
Hermann Hospital[1-3-390]	Houston, Texas	L. M. Vaughan	47,205	41	4,546	322	2	4	125
St. Joseph's Hospital[1-3]	Houston, Texas	C. W. Yates	28,846	15	2,444	51	1	1	220
University of Texas M.D. Anderson Hospital and Tumor Institute[1-3]	Houston, Texas	G. A. Fletcher	15,003	555	14,173	21,770	..	9	200
University of Texas Postgraduate Medical School Affiliated Hospitals									
Baptist Memorial Hospital[1-3]	San Antonio, Texas	E. F. Lyon, Jr.	17,031	72	1,479	68	1	3	200
Robert B. Green Memorial Hospital[1-3]	San Antonio, Texas	B. B. Markette	30,650	19	1,530	91	3	6	200
≠Santa Rosa Hospital[1-3]	San Antonio, Texas	J. J. Wiesner	16,962	40	1,273	29	1	3	250
Scott and White Memorial Hospitals[1-3]	Temple, Texas	A. W. Sommer	48,271	110	5,427	520	1	3	300
University of Utah Affiliated Hospitals									
Dr. W. H. Groves Latter-Day Saints Hospital[1-3]	Salt Lake City	E. Crowder	11,166	27	586	10	1	3	250
Holy Cross Hospital[1-3]	Salt Lake City	R. R. Meyer	9,616	..	1,612	...	1	3	175
≠St. Mark's Hospital[1-3]	Salt Lake City	H. P. Plenk	9,591	17	1,526	70	1	1	275
≠Salt Lake County General Hospital[3]	Salt Lake City	W. Christensen	18,198	23	3,208	227	2	6	220
Veterans Admin. Hospital[1-3]	Salt Lake City	D. W. Stowell	8,980	..	.....	...	1	3	...
University of Vermont Affiliated Hospitals									
De Goesbriand Memorial Hospital	Burlington, Vt.	F. W. Van Buskirk	12,328	..	879	91	2	5	167
Mary Fletcher Hospital[1-3-367]	Burlington, Vt.	A. B. Soule, Jr.	18,050	39	4,314	100	2	5	166
University of Virginia Hospital[1-3]	Charlottesville, Va.	V. W. Archer	45,384	58	7,873	400	2	7	100
De Paul Hospital[1-3]	Norfolk, Va.	J. Foster	17,421	36	3,205	35	1	3	200
Norfolk General Hospital[1-3]	Norfolk, Va.	C. P. Wisoff	14,692	86	2,131	87	1	4	290
Medical College of Virginia—Hospital Division[1-3]	Richmond, Va.	F. B. Mandeville	47,758	131	4,069	452	1	5	75
Veterans Admin. Hospital[1-3-270]	Richmond, Va.	W. H. Mendel	26,275	2	3,123	73	1	3	...
Providence Hospital[1-3]	Seattle	E. A. Addington	16,637	50	543	119	2	2	215
Virginia Mason Hospital[1-3]	Seattle	T. Carlile	33,049	64	3,430	920	1	3	250
Sacred Heart Hospital[3]	Spokane, Wash.	C. A. Stevenson	18,730	79	1,368	...	2	2	250
University Hospitals[1-3]	Madison, Wis.	L. Paul	47,529	183	7,025	361	4	11	100
Columbia Hospital[1-350]	Milwaukee	S. A. Morton	23,284	42	3,090	772	1	1	245
Evangelical Deaconess Hospital[1-3]	Milwaukee	A. Melamed	28,984	29	4,870	154	1	3	300
Milwaukee County Hospital[1-3]	Milwaukee	J. L. Marks-M. Greenberg	38,212	35	6,745	410	2	6	207
Milwaukee Hospital[1-3]	Milwaukee	H. W. Hefke-J. Armbruster	33,985	161	8,834	...	1	3	270
St. Joseph's Hospital[1-3]	Milwaukee	G. W. Sengpiel	21,318	39	4,715	352	1	3	280
St. Luke's Hospital[1-3]	Milwaukee	H. H. Wright	15,133	36	3,049	349	1	2	275
Veterans Admin. Hospital[1-3-385]	Milwaukee (Wood), Wis.	R. V. McAllister	40,806	7	9,035	261	1	3	...
San Juan City Hospital[1-3]	San Juan, P. R.	J. L. Becerra	17,230	21	6,933	109	1	2	150
Veterans Admin. Hospital[1-3]	San Juan, P. R.	L. Ehrlich	9,690	..	.....	...	1	2	...
Dr. I. Gonzales Martinez Oncologic Hospital[1-3]	San Juan, P. R.	V. A. Marcial	.....	130	22,840	840	3	9	200

26. SURGERY

Residency programs in the following hospitals have been approved by the Council, the American Board of Surgery and the American College of Surgeons, through the Conference Committee on Graduate Training in Surgery, for FOUR OR MORE years of training, designed to qualify the trainee for examination by the American Board of Surgery as a Group I candidate.

Hospitals, 329; Assistant Residencies and Residencies, 4,222

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[8]	Beginning Stipend (Month)
UNITED STATES AIR FORCE							
U. S. Air Force Hospital	San Antonio, Texas	D. S. Wenger	4,421	30	5	14	...
UNITED STATES ARMY							
Letterman Army Hospital[1-3]	San Francisco	J. Graham	1,430	13	3	12	...
Fitzsimons Army Hospital[1-3]	Denver	C. S. Lyter	769	25	2	8	...
Army Medical Center[1-3]	Washington, D. C.	J. H. Forsee	1,021	29	4	17	...
Brooke Army Hospital[1-3]	San Antonio, Texas	W. W. Nichol	2,305	60	4	16	...
Tripler Army Hospital[1-3]	Honolulu T. H.	W. F. Bowers	8,850	23	3	12	...
UNITED STATES NAVY							
U. S. Naval Hospital[1-3]	Oakland, Calif.	M. L. Gerber	1,701	42	4	10	...
U. S. Naval Hospital[1]	San Diego, Calif.	J. M. Hanner	2,846	40	6	12	...
U. S. Naval Hospital[1-3]	Bethesda, Md.	R. B. Brown	1,646	...	4	9	...
U. S. Naval Hospital[1-3]	Chelsea, Mass.	L. L. Haynes	2,628	20	1	5	...
U. S. Naval Hospital[1]	St. Albans, N. Y.	R. N. Grant	1,596	4	4	8	...
U. S. Naval Hospital[1-3]	Philadelphia	P. J. McNamara	2,477	33	5	10	...
U. S. Naval Hospital[1-3]	Portsmouth, Va.	J. J. Zuska	3,719	39	6	10	...

Numerical and other references will be found on pages 640 through 642.

26. SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [*]	Total Residencies Offered [*]	Beginning Stipend (Month)
UNITED STATES PUBLIC HEALTH SERVICE							
U S Public Health Service Hospital [1-3]	San Francisco	W A Williamson	2,269	28	1	4	...
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE							
Freedmen's Hospital [1 3]	Washington, D C	B Syphax	1,429	23	3	13	308
NONFEDERAL AND VETERANS ADMINISTRATION							
University of Alabama Affiliated Hospitals							
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala	C Lyons	6,414	64	12	30	108
Veterans Admin Hospital [1-3]	Birmingham, Ala	R A Dillard	739	26	4	10	...
Lloyd Noland Hospital [1-3]	Fairfield, Ala	J M Slaughter	2,239	17	2	5	298
Maricopa County General Hospital [1-3]	Phoenix, Ariz	M Wood	600	13	2	7	300
University Hospital [1-3]	Little Rock, Ark	J H Growdon	1,287	28	4	14	155
Veterans Admin Hospital [1-3]	Little Rock, Ark	R I Lipin	2,584	69	1	6	...
San Joaquin General Hospital [1]	French Camp, Calif	W Brock	1,889	70	2	7	250
General Hospital of Fresno County [1-3-53]	Fresno, Calif	B H Evans	2,225	68	2	6	300
Veterans Admin Hospital [1-3-54-57]	Long Beach, Calif	H J Movius	2,180	37	5	14	...
Cedars of Lebanon Hospital [1 3]	Los Angeles	D State	2,374	30	3	10	265
Los Angeles County Hospital [1]	Los Angeles	C J Berne	7,013	272	4	16	246
University of California Hospital [1-3]	Los Angeles	W P Longmire, Jr	1,129	33	2	8	229
Veterans Admin Hospital [1-3]	Los Angeles	J S Clarke	3,548	112	10	22	...
White Memorial Hospital [1-3-67]	Los Angeles	A I Kugel	1,577	18	2	6	215
Highland—Alameda County Hospital [1-3]	Oakland, Calif	F M Taylor	1,698	45	7	15	200
Kaiser Foundation Hospital [1 3]	Oakland, Calif	A L Baritell	2,418	51	4	10	315
Veterans Admin Hospital	Oakland, Calif	J V Smith		.	4	11	...
San Diego County General Hospital [1-3]	San Diego, Calif	R G Franklin	926	41	4	10	250
Kaiser Foundation Hospital [1-3]	San Francisco	D W Barrow	2,451	44	2	8	200
Mount Zion Hospital [1-3]	San Francisco	I D Rosenman	6,059	72	3	7	150
San Francisco Hospital							
Stanford University Service [1]	San Francisco	C Mathewson	1,668	30	4	6	205
University of California Service [1]	San Francisco	C Lyon	1,748	37	4	6	205
Stanford University Hospitals [1-3-78-80]	San Francisco	V Richards	1,409	60	5	13	100
University of California Hospitals [3-82]	San Francisco	L Goldman	2,336	67	4	16	231
Veterans Admin Hospital [1-3-85]	San Francisco	L G Brizzolara	1,236	33	4	13	...
Santa Clara County Hospital [1-3]	San Jose, Calif	J D Lamon, Jr	749	38	3	7	260
Santa Barbara General Hospital—Santa Barbara Cottage Hospital	Santa Barbara, Calif	J R Rydell L G Fiske	1,423	35	4	9	200
Harbor General Hospital [1]	Torrance, Calif	L Cowley	1,447	67	4	14	246
St Joseph's Hospital [1-3]	Denver	W B Condon	1,943	16	4	10	200
University of Colorado Medical Center							
Colorado General Hospital [1-3]	Denver	H Swan	1,447	50	4	21	180
Denver General Hospital [1-3]	Denver	D Watkins	2,817	113	.	.	179
Veterans Admin Hospital [1 3-91]	Denver	B Eiseman	1,511	58	6	15	...
St Vincent's Hospital [1-3]	Bridgeport, Conn	W Curley, Jr	6,195	62	2	8	300
Hartford Hospital [1-3-104]	Hartford, Conn	W A Standish	6,054	66	8	22	125
St Francis Hospital [1-3]	Hartford, Conn	L A St John	4,371	55	2	6	175
New Britain General Hospital [1-3]	New Britain, Conn	B B Clark	6,150	37	1	4	210
Grace—New Haven Community Hospital [1-3-105]	New Haven, Conn	G E Lindskog C C Bishop	3,767	59	6	23	140
Veterans Admin Hospital [1-3]	Newington, Conn	P W Fenney	1,142	19	4	11	...
Waterbury Hospital [1]	Waterbury, Conn	A E Herrmann	4,815	72	1	4	225
Veterans Admin Hospital [1-3]	West Haven, Conn	W W Lindenmuth	2,304	36	3	9	...
Delaware Hospital [1-3]	Wilmington, Del	D J Preston	3,468	74	2	5	220
Memorial Hospital [1-3]	Wilmington, Del	J C Pierson	5,461	43	1	4	225
District of Columbia General Hospital [1-3]	Washington, D C	B Blades R Coffey	1,602	50	4	12	233
Georgetown University Service	.		.		.	.	.
George Washington University Service							
Georgetown University Hospital [1-3]	Washington, D C	R J Coffey	3,825	70	6	18	175
George Washington University Hospital [1-3]	Washington, D C	B Blades	6,730	48	5	11	150
Providence Hospital [3]	Washington, D C	L B Gaffney	9,240	40	2	8	350
Veterans Admin Hospital [1-3-118]	Washington, D C	J G Lee	1,582	49	3	9	...
Washington Hospital Center [1-3-120]	Washington, D C	C D Briggs	8,079	93	8	17	215
Veterans Admin Hospital [1-3]	Coral Gables, Fla	M Wollcott	2,439	84	5	14	...
Duval Medical Center [1-3]	Jacksonville, Fla	K A Morris	2,632	41	4	10	150
St Vincent's Hospital [3]	Jacksonville, Fla	A C Williams	4,361	32	4	10	225
Jackson Memorial Hospital [1-3]	Miami, Fla	J J Farrell	5,451	125	7	19	75
Grady Memorial Hospital [1]	Atlanta, Ga	I A Ferguson	4,380	118	12	29	100
Piedmont Hospital [1-3]	Atlanta, Ga	F W McRae	3,629	16	1	4	290
St Joseph's Infirmary [1-3]	Atlanta, Ga	D Shepard	4,675	40	3	8	270
Veterans Admin. Hospital [1-3]	Atlanta, Ga	J C Thoroughman	1,635	70	6	19	...
Medical College of Georgia Hospitals							
Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga	W Moretz	467	19	6	20	250
University Hospital	Augusta, Ga	J Sherman	2,529	20	1	5	200
Veterans Admin Hospital [1-3]	Augusta, Ga	C M Rhode	1,246	40	3	5	...
Emory University Hospital [1-3]	Emory University, Ga	J D Martin, Jr	5,170	17	6	7	235
Cook County Hospital	Chicago	K A Meyer	11,492	129	8	31	140
Illinois Central Hospital [1-3]	Chicago	C. C Guy	3,515	38	1	4	252
Michael Reese Hospital [1-3]	Chicago	N N Crohn	2,870	27	3	9	125
Mount Sinai Hospital [1-3]	Chicago	E I Greene	3,955	23	2	6	225
Northwestern University Medical Center							
Chicago Wesley Memorial Hospital [1-3]	Chicago	W Maddock	2,922	42	5	8	125
Passavant Memorial Hospital [1-3]	Chicago	L Davis	1,543	14	3	6	125
Veterans Admin Research Hospital [1-3]	Chicago	F W. Preston	1,605	25	5	12	...
Evanston Hospital [1-3]	Evanston, Ill	J M Dorsey	2,431	32	1	3	225
Presbyterian St Luke's Hospital							
Presbyterian Hospital Division [1-3]	Chicago	E J. Beattie, Jr.	2,969	42	4	16	125
St Luke's Hospital Division [1-3]	Chicago	B C. Kilbourne	2,140	43	4	12	125
University of Chicago Clinics [1-3]	Chicago	L R Dragstedt	3,418	107	6	18	200
University of Illinois							
Research and Educational Hospitals [1-3]	Chicago	W H Cole	1,823	71	4	13	140
Veterans Admin West Side Hospital [1-3-134]	Chicago	M I Gibbel	2,235	51	4	17	...
St Francis Hospital [1]	Evanston, Ill	D. P. Slaughter	3,296	39	2	7	210
Veterans Admin. Hospital [1-3-138]	Hines, Ill	C. B Puestow	2,922	77	21	48	...

Numerical and other references will be found on pages 640 through 642.

26. SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
Indianapolis General Hospital [1-3]	Indianapolis	H. G. Becker	1,905	54	2	8	205
Indiana University Medical Center Affiliated Hospitals							
Indiana University Medical Center Hospital [1]	Indianapolis	H. B. Shumacker, Jr.	1,091	82	5	14	165
Veterans Admin. Hospital [1-3]	Indianapolis	L. R. Radigan	758	82	..	..	...
Iowa Methodist Hospital [1-3-142]	Des Moines, Iowa	J. B. Priestley	1,647	33	2	8	200
Veterans Admin. Hospital [1-3]	Des Moines, Iowa	L. T. Palumbo	2,440	43	4	16	...
State University of Iowa Hospitals [1-3]	Iowa City	R. T. Tidrick	3,020	118	8	22	175
Veterans Admin. Hospital [1-3]	Iowa City	E. S. Brintnall	1,937	63	6	12	...
University of Kansas Medical Center [1-3]	Kansas City, Kan.	F. Allbritten, Jr.	1,581	59	5	16	125
Veterans Admin. Hospital [1-3]	Kansas City, Mo.	G. A. Higgins	1,466	29	..	..	...
St. Joseph Hospital [3]	Lexington, Ky.	F. M. Massie	1,795	20	2	8	210
University of Louisville Medical Center							
Children's Hospital	Louisville, Ky.	H. B. Lynn	3,352	..	1	4	83.35
Louisville General Hospital [1-3]	Louisville, Ky.	R. J. Noer	1,969	60	8	20	83
Waverly Hills Tuberculosis Sanatorium	Waverly Hills, Ky.	.....	.....	...	..	..	...
St. Joseph Infirmary [1-3]	Louisville, Ky.	J. T. Giannini	7,544	35	4	10	210
Veterans Admin. Hospital [1-3-150]	Louisville, Ky.	J. E. Hamilton	1,404	36	3	13	...
Charity Hospital of Louisiana							
Independent Unit [1]	New Orleans	R. Kahle	2,252	42	3	12	100
Louisiana State University Unit [1-7]	New Orleans	J. D. Rives	3,497	76	6	24	100
Tulane University Unit [1]	New Orleans	O. Creech	3,098	93	6	25	100
Veterans Admin. Hospital [1-3-158]	New Orleans	L. K. Richardson	1,558	53	5	10	...
Confederate Memorial Medical Center [1]	Shreveport, La.	P. D. Abramson	3,299	36	6	16	125
Maine Medical Center [1]	Portland, Maine	J. M. Parker	2,313	40	2	8	125
Baltimore City Hospitals [1-3]	Baltimore	M. M. Ravitch	1,003	69	6	18	75
Church Home and Hospital [1-3]	Baltimore	O. C. Brantigan	3,537	36	4	10	200
Franklin Square Hospital [1-3]	Baltimore	H. E. Wilgis	2,798	26	2	5	225
Johns Hopkins Hospital [1-3]	Baltimore	A. Blalock	4,387	105	4	13	160
Maryland General Hospital [1-3]	Baltimore	W. M. Firor	3,830	43	2	10	225
Mercy Hospital [1-7]	Baltimore	D. J. Pessagno	3,261	25	2	6	275
Sinai Hospital [1-3]	Baltimore	A. M. Seligman	2,820	37	6	12	110
Union Memorial Hospital [1-3]	Baltimore	E. S. Stafford	5,504	49	4	8	215
University Hospital [1]	Baltimore	R. W. Buxton	3,537	46	10	23	75
Prince George's General Hospital [1-3]	Cheverly, Md.	S. Schwartzbach	4,411	27	2	6	200
Veterans Admin. Hospital [1-3]	Fort Howard, Md.	J. M. Miller	1,055	37	2	6	...
Veterans Admin. Hospital [1-3-167]	Perry Point, Md.	R. T. Shackelford	849	23	1	5	...
Beth Israel Hospital [1-3]	Boston	J. Fine	2,531	39	5	17	167
Boston City Hospital	Boston						
I Surgical Service [1-3]		C. G. Child	2,287	40	8	21	132
III Surgical Service [1-3]		J. J. Byrne	2,289	65	8	21	132
V Surgical Service [1-3]		J. E. Dunphy	2,229	50	9	26	132
Carney Hospital [2-189]	Boston	J. J. Todd	5,880	39	5	14	150
Massachusetts General Hospital [1-3]	Boston	E. D. Churchill	8,061	..	3	26	67
Massachusetts Memorial Hospitals [1-3-173]	Boston	R. H. Smithwick	1,731	29	6	22	175
New England Center Hospital [1-3]	Boston	H. F. Rheinlander	2,641	25	5	15	100
Peter Bent Brigham Hospital [1-3-177]	Boston	F. D. Moore	3,292	120	6	20	42
St. Elizabeth's Hospital [1-3-169]	Boston	J. W. Spellman	5,651	46	2	8	125
Veterans Admin. Hospital [1-3-170]	Boston (Jamaica Plain)	H. H. Faxon	2,637	79	8	24	...
Cambridge City Hospital [1-3]	Cambridge, Mass.	J. B. Vernaglia	1,304	38	1	4	160
Quincy Hospital [1-3-160]	Quincy, Mass.	J. M. McGowan	2,638	31	1	4	179
Springfield Hospital [1-3]	Springfield, Mass.	W. F. Hoyt	8,042	75	6	14	100
Memorial Hospital [1-3]	Worcester, Mass.	B. C. Wheeler	5,380	51	2	6	200
St. Vincent Hospital	Worcester, Mass.	J. C. McCann	5,449	68	4	9	175
Worcester City Hospital [1-3]	Worcester, Mass.	J. Maroney	2,421	57	4	8	215
St. Joseph Mercy Hospital [1-3]	Ann Arbor, Mich.	E. T. Thieme	1,646	18	4	7	310
University Hospital [1-3-181]	Ann Arbor, Mich.	H. K. Ransom	2,583	97	27	66	160
Detroit Memorial Hospital [1-3-196]	Detroit	J. Mark	4,278	58	1	4	425
Grace Hospital [1-3]	Detroit	R. P. Reynolds	8,973	118	4	16	275
Harper Hospital [1-3]	Detroit	E. A. Osius	3,445	39	12	22	275
Henry Ford Hospital [1-3]	Detroit	L. S. Fallis	9,240	126	20	56	250
Mount Carmel Mercy Hospital [1-3]	Detroit	W. S. Carpenter	10,624	67	4	16	275
Sinai Hospital [1-3]	Detroit	M. P. Meyers	3,772	46	2	5	275
Wayne State University A[illegible]							
Veterans Admin. Hospital [1-3]	Dearborn, Mich.	C. G. Johnston	2,009	73	7	21	...
Receiving Hospital [1-3]	Detroit	C. G. Johnston	5,032	152	10	42	303
St. John Hospital [1-3]	Detroit	C. J. France	2,158	4	2	6	325
Wayne County General Hospital and Infirmary [1-3]	Eloise, Mich.	W. W. Glas	3,293	92	4	13	336
Hurley Hospital [1-3]	Flint, Mich.	A. H. Kretchmar	4,684	62	2	8	325
McLaren General Hospital [1]	Flint, Mich.	E. P. Vary	6,796	53	3	7	350
Blodgett Memorial Hospital [1-3]	Grand Rapids, Mich.	W. J. Fuller	1,748	25	1	4	300
Butterworth Hospital [1-3]	Grand Rapids, Mich.	W. McDougal	2,978	21	2	7	300
Highland Park General Hospital [1-3]	Highland Park, Mich.	J. A. Witter	1,654	43	2	8	308
Minneapolis General Hospital	Minneapolis	C. R. Hitchcock	1,223	80	6	15	220
University of Minnesota Hospitals [1-3-213]	Minneapolis	O. H. Wangensteen	1,936	113	9	29	200
Veterans Admin. Hospital [1-3-215]	Minneapolis	D. J. Ferguson	1,862	73	10	22	...
Mayo Foundation and Clinic	Rochester, Minn.	J. M. Waugh	11,180	188	20	74	175
Ancker Hospital [1-3]	St. Paul	L. D. MacLean	2,114	115	2	8	220
University of Mississippi Medical Center							
University Hospital [1]	Jackson, Miss.	J. D. Hardy	1,429	29	6	20	250
Veterans Admin. Hospital [1-3]	Jackson, Miss.	J. H. Conn	1,264	16	..	..	...
University of Missouri Medical Center [1-3]	Columbia, Mo.	H. E. Stephenson, Jr.	899	32	7	17	200
Kansas City General Hospital No. 1 [1-3]	Kansas City, Mo.	R. R. Coffey	1,712	120	2	8	200
Barnes Hospital [1-7]	St. Louis	C. A. Moyer	3,307	71	15	34	50
Homer G. Phillips Hospital [1-3]	St. Louis	C. Moyer	3,104	80	12	25	201
Jewish Hospital [1-3]	St. Louis	M. D. Pareira	3,944	43	3	9	150
Missouri Pacific Hospital [3]	St. Louis	R. A. Weir	2,016	29	6	12	200
St. Louis City Hospital [1-3-228]	St. Louis	C. A. McAfee-L. V. Mulligan	2,475	67	8	19	234
St. Luke's Hospital [1-3]	St. Louis	C. E. Lischer	3,752	51	2	7	250
St. Mary's Group of Hospitals [1-3]	St. Louis	C. R. Hanlon	2,668	52	4	13	100
Veterans Admin. Hospital							
St. Louis University Unit [1-3]	St. Louis	C. J. Galbraith, Jr.	1,172	45	2	8	...
Washington University Unit [1-3]	St. Louis	F. B. Hershey	1,212	31	2	8	...
Creighton Memorial-St. Joseph's Hospital	Omaha, Neb.	B. R. Walske	5,622	35	3	12	210

Numerical and other references will be found on pages 640 through 642.

26a SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
University of Nebraska Hospital [1-3-230]	Omaha, Neb.	M. M. Musselman	605	29	2	8	200
Veterans Admin. Hospital [1-3-232]	Omaha, Neb.	W. P. Kleitsch	1,878	43	2	8	...
Dartmouth Medical School Affiliated Hospitals			2,140	37	5	18	218
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	W. T. Mosenthal	.....	...	..	..	...
Veterans Admin. Hospital [1-3]	White River Jct., Vt.	W. B. Crandell	.....	...	..	..	...
Jersey City Medical Center	Jersey City, N. J.	E. J. Halligan	5,878	76	8	26	108
Newark Beth Israel Hospital [1-3]	Newark, N. J.	M. Singer	6,292	35	1	4	100
Veterans Admin. Hospital [242]	Albuquerque, N. M.	W. A. Childs	1,466	22	4	14	...
Albany Hospital [1-3-243]	Albany, N. Y.	C. Eckert	3,505	63	5	14	160
Veterans Admin. Hospital [1-3-245]	Albany, N. Y.	J. A. Nelson	2,175	77	3	12	...
Brooklyn Hospital [1-3]	Brooklyn, N. Y.	K. H. MacGregor	4,120	33	2	8	175
Coney Island Hospital [1-3]	Brooklyn, N. Y.	J. E. Hammett	2,816	56	4	10	105
Jewish Hospital [1-3]	Brooklyn, N. Y.	L. Berger	4,968	13	2	8	100
Kings County Hospital							
Division I [1-3]	Brooklyn, N. Y.	J. F. Raycroft	3,272	76	4	16	105
Division II [1-3]	Brooklyn, N. Y.	C. Dennis	3,021	94	4	13	105
Long Island College Hospital [1-3]	Brooklyn, N. Y.	E. J. Browder	2,963	34	1	5	156
Maimonides Hospital [1-3]	Brooklyn, N. Y.	A. Hurwitz	3,828	48	5	10	75
Methodist Hospital [1-3]	Brooklyn, N. Y.	A. J. Vosseler	2,582	21	2	5	175
St. John's Episcopal Hospital [1-3]	Brooklyn, N. Y.	C. Dennis	2,521	16	1	4	175
Veterans Admin. Hospital [1-3]	Brooklyn, N. Y.	H. H. LeVeen	1,600	31	7	20	...
Wyckoff Heights Hospital [1-3]	Brooklyn, N. Y.	P. Zoller	2,617	45	3	12	100
Allied Hospitals of the Sisters of Charity of Buffalo [1-3]	Buffalo	F. Zaepfel	11,360	73	2	8	235
Buffalo General Hospital [1-3]	Buffalo	J. R. Paine	3,258	63	4	14	175
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	J. D. Stewart	1,940	81	3	14	247
Millard Fillmore Hospital [1-3]	Buffalo	H. N. Kenwell	4,407	40	4	11	285
Veterans Admin. Hospital [1-3-249]	Buffalo	W. M. Chardack	1,656	53	5	14	...
Mary Imogene Bassett Hospital [1-3-252]	Cooperstown, N. Y.	J. H. Powers	1,207	21	2	5	150
Flushing Hospital and Dispensary [1-3-254]	Flushing, N. Y.	C. N. Baker	4,929	27	1	4	175
Meadowbrook Hospital [1-3]	Hempstead, N. Y.	J. N. Shell	1,579	81	3	12	225
Queens Hospital Center [1-3]	Jamaica, N. Y.	L. J. Morse	3,376	158	3	10	105
Nassau Hospital [3]	Mineola, N. Y.	E. T. Montgomery	2,200	39	3	9	318
Long Island Jewis[illegible]	[illegible] Park, N. Y.	P. E. Lear	3,630	41	1	4	75
Beekman-Downtown [illegible]	[illegible] York City	S. Mage	.....	...	3	8	190
Bellevue Hospital Center							
Div. I—Columbia University [1-3-258]	New York City	K. M. Lewis, Sr.	1,459	25	7	17	105
Div. II—Cornell University [1-3-261]	New York City	C. W. Holman	1,854	43	4	15	105
Div. III—New York University College of Medicine [270]	New York City	J. H. Mulholland	2,614	25	8	18	105
Div. IV—New York University Post-Graduate Medical School [274]	New York City	J. W. Hinton	2,312	37	8	35	104
Beth Israel Hospital [1-3-265]	New York City	L. Ginzburg	2,810	25	2	5	155
Bronx Hospital [1-3]	New York City	R. Friedlander	2,701	17	4	10	100
Bronx Municipal Hospital Center [1-3]	New York City	W. Metcalf	1,156	60	4	20	125
Harlem Hospital [1-3]	New York City	A. D. Maynard	1,088	15	4	12	105
Knickerbocker Hospital [1-3]	New York City	P. Allen	2,078	25	3	10	150
Lenox Hill Hospital [1-3]	New York City	H. C. Maier-F. M. Donehue	3,162	35	2	8	180
Lincoln Hospital [1-3]	New York City	F. H. Amendola	2,968	17	4	13	105
Montefiore Hospital [1-3]	New York City	E. S. Hurwitt	4,395	69	6	11	187
Mount Sinai Hospital [1-3]	New York City	I. D. Baronofsky	4,003	63	9	21	75
New York Hospital [1-3]	New York City	F. Glenn	3,731	103	9	30	164
New York Medical C[illegible] Medical Center							
[illegible]	New York City	J. M. Winfield	4,160	5	2	8	100
[illegible]	New York City	J. M. Winfield	2,228	31	2	10	105
N[illegible] Hospital [1]	New York City	J. E. Hammett	2,695	17	3	12	125
P[illegible]	New York City	G. H. Humphreys	4,681	44	8	26	250
Roosevelt Hospital [1]	New York City		3,803	57	7	16	133
St. Clare's Hospital [1-3]	New York City	J. L. Madden	4,367	50	2	8	200
St. Luke's Hospital [1-3]	New York City	H. A. Zintel	4,122	52	6	15	100
St. Vincent's Hospital [1-3]	New York City	L. M. Rousselot	4,578	102	6	19	125
Veterans Admin. Hospital (Bronx) [1-3-281]	New York City	P. Cooper	2,005	47	5	14	...
Veterans Admin. Hospital (Manhattan) [1-3-285]	New York City	W. F. MacFee	2,337	81	5	20	...
Genesee Hospital [1-3]	Rochester, N. Y.	E. Douglas	3,827	53	2	7	175
Highland Hospital [1-3]	Rochester, N. Y.	T. B. Garlick	3,869	45	2	5	175
Rochester General Hospital [1-3-288]	Rochester, N. Y.	G. R. Bodon	4,031	73	3	10	125
St. Mary's Hospital [1-3]	Rochester. N. Y.	J. Remington	1,916	13	2	8	230
Strong Memorial-Rochester Municipal Hospital [1-3-291]	Rochester, N. Y.	W. J. M. Scott	3,070	121	4	13	117
State University of New York							
Upstate Medical Center [1-3]	Syracuse, N. Y.	C. B. Muller	14,155	180	10	30	233
Veterans Admin. Hospital [1-3]	Syracuse, N. Y.	L. S. Rogers	1,740	40	4	10	...
Grasslands Hospital [1-3]	Valhalla, N. Y.	G. C. Adie	706	31	1	5	175
North Carolina Memorial Hospital [1-3-299]	Chapel Hill, N. C.	N. A. Womack	944	26	7	19	175
Duke Hospital [1-303]	Durham, N. C.	D. Hart	2,023	26	12	24	127
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C.	H. H. Bradshaw	2,156	39	4	16	166
Akron City Hospital [1-3]	Akron, Ohio	S. A. Schlueter	3,970	89	4	12	250
Akron General Hospital [1-307]	Akron, Ohio	R. T. Allison	4,550	68	4	12	250
St. Thomas Hospital [1-3]	Akron, Ohio	A. H. Kyriakides	4,346	28	3	9	250
Good Samaritan Hospital [1-3-312]	Cincinnati	H. J. Brinker	2,489	18	3	12	250
St. Mary's Hospital [1-3]	Cincinnati	R. D. Mansfield	2,326	24	1	4	250
University of Cincinnati College of Medicine Hospital Group							
Cincinnati General Hospital [1-3]	Cincinnati	W. A. Altemeier	2,408	83	9	30	75
Veterans Admin. Hospital [1-3]	Cincinnati	A. Keirle	819	43	..	9	...
Cleveland Clinic Hospital [1-3]	Cleveland	G. Crile, Jr.	1,192	22	10	21	175
Cuyahoga County Hospital [1-3]	Cleveland	F. A. Simeone	1,597	56	9	21	162
Huron Road Hospital [1-3]	Cleveland	H. W. Brown	2,724	48	2	8	210
Lutheran Hospital [1-3]	Cleveland	M. M. Driver	3,698	19	3	7	250
Mount Sinai Hospital [1-3]	Cleveland	S. O. Freedlander	2,406	24	4	10	215
St. Alexis Hospital [1-3]	Cleveland	C. R. Lulenski	5,932	51	4	10	250
St. Luke's Hospital [1-3]	Cleveland	F. S. Cross	4,049	64	2	8	140
St. Vincent Charity Hospital [1-3]	Cleveland	F. Vecchio	5,369	64	4	12	210
University Hospitals [1-3]	Cleveland	W. D. Holden	4,431	71	8	20	150

Numerical and other references will be found on pages 640 through 642.

26. SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [9]	Beginning Stipend (Month)
Veterans Admin. Hospital [1-3]	Cleveland	C. L. Cogbill	1,421	45	8	16	...
Ohio State University Hospitals University Hospital [1-3-322]	Columbus, Ohio	R. M. Zollinger	3,686	86	6	18	177
White Cross Hospital [1-3-324]	Columbus, Ohio	R. Patton	3,881	38	2	5	290
Veterans Admin. Hospital [1-3]	Dayton, Ohio	C. C. Burton	1,902	90	4	16	...
St. Elizabeth Hospital [1-3]	Youngstown, Ohio	J. K. Herald	8,193	67	4	10	300
Youngstown Hospital [1-3]	Youngstown, Ohio	G. G. Nelson	10,422	86	4	12	325
University of Oklahoma Hospitals [1-3-328]	Oklahoma City	J. A. [illegible]	1,445	51	8	27	200
Veterans Admin. Hospital [3-332]	Oklahoma City	G. S. [illegible]	1,873	76	4	12	...
St. Vincent's Hospital [1-3]	Portland, Ore.	A. M. Boyden	6,938	38	2	8	275
University of Oregon Medical School Hospitals and Clinics [1-3-334]	Portland, Ore.	W. K. Livingston	1,710	65	2	8	125
Veterans Admin. Hospital [1-3]	Portland, Ore.	R. A. Wise	1,370	24	5	16	...
Abington Memorial Hospital [1-3]	Abington, Pa.	C. M. Smyth	2,486	46	1	4	150
Allentown Hospital [1-3]	Allentown, Pa.	R. L. Schaeffer	2,926	49	1	4	225
Bryn Mawr Hospital [1-3-336]	Bryn Mawr, Pa.	F. R. Robbins	4,180	37	2	5	200
Geo. F. Geisinger Memorial Hospital [1-3]	Danville, Pa.	J. R. Babcock	1,991	31	1	4	175
Hamot Hospital [1-3]	Erie, Pa.	B. Goldman	5,226	41	1	4	250
Harrisburg Hospital [1-3]	Harrisburg, Pa.	C. E. Moore	5,351	61	2	5	250
Germantown Dispensary and Hospital [1-3-339]	Philadelphia	S. D. Weeder	2,628	54	1	4	175
Graduate Hospital of the University of Pennsylvania [1-3]	Philadelphia	H. R. Hawthorne	1,386	20	4	8	100
Hahnemann Medical College and Hospital [1-3]	Philadelphia	J. M. Howard	2,647	38	3	12	75
Hospital of the University of Pennsylvania [1-3]	Philadelphia	I. S. Ravdin	4,650	110	10	29	150
Hospital of the Woman's Medical College of Pennsylvania [1-3]	Philadelphia	L. K. Ferguson	1,702	37	1	6	110
Jefferson Medical College Hospital [1-3]	Philadelphia	J. H. Gibbon, Jr.	3,108	66	4	16	100
Lankenau Hospital [1-3]	Philadelphia	J. M. Deaver-G. C. Engel	2,372	26	2	8	200
Misericordia Hospital [1]	Philadelphia	W. D. O'Sullivan	2,089	49	1	4	250
Pennsylvania Hospital [1-3]	Philadelphia	O. C. King	1,739	50	12	12	95
Presbyterian Hospital [1-3]	Philadelphia	O. C. King	2,500	52	2	8	175
Temple University Hospital [1-3]	Philadelphia	W. E. Burnett	2,458	43	3	12	...
Veterans Admin. Hospital [1-3]	Philadelphia	O. Serlin	1,078	57	5	13	...
Allegheny General Hospital [1]	Pittsburgh	N. K. Hammond	1,723	19	1	4	200
Mercy Hospital [1-3]	Pittsburgh	H. G. Kuehner	3,533	25	2	8	235
Health Center Hospitals of the University of Pittsburgh School of Medicine							
Children's Hospital	Pittsburgh	....	.....	...	..	..	...
Presbyterian Hospital [1-3]	Pittsburgh	S. P. Harbison-W. Kiesewetter	1,593	23	4	10	125
Veterans Admin. Hospital [1-3-319]	Pittsburgh	F. C. Jackson	1,985	50	7	19	...
Western Pennsylvania Hospital [3]	Pittsburgh	G. V. Foster	9,666	95	3	11	225
Robert Packer Hospital [1-3]	Sayre, Pa.	D. Guthrie	3,193	30	2	6	225
York Hospital [3]	York, Pa.	F. M. Weaver	7,036	45	1	4	300
Rhode Island Hospital [1-3]	Providence, R. I.	J. M. Beardsley	4,951	56	2	8	125
Veterans Admin. Hospital [1-3-351]	Providence, R. I.	H. W. Harrower	2,203	38	2	12	...
Teaching Hospitals of the Medical College of South Carolina	Charleston, S. C.	F. E. Kredel	3,810	58	3	14	137
Medical College Hospital		....	.....	...	..	..	...
Roper Hospital		....	.....	...	..	..	...
Greenville General Hospital [1]	Greenville, S. C.	L. W. Stoneburner	6,065	59	1	4	250
Baptist Memorial Hospital [1-3-352]	Memphis, Tenn.	R. M. Miles	11,593	57	2	7	260
City of Memphis Hospitals [1-3]	Memphis, Tenn.	H. Wilson	2,095	33	3	13	150
Veterans Admin. Hospital [1-3]	Memphis, Tenn.	R. F. Bowers	3,239	82	9	21	...
George W. Hubbard Hospital [1-3]	Nashville, Tenn.	M. Walker	1,668	33	3	13	125
Nashville General *Hospital* [1-3]	Nashville, Tenn.	O. F. Noel	1,346	18	3	8	175
St. Thomas Hospital [1-3]	Nashville, Tenn.	W. R. Cate, Jr.	5,746	29	3	9	300
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	H. W. Scott, Jr.	2,725	39	4	14	50
Veterans Admin. Hospital [1-3]	Nashville, Tenn.	R. I. Carlson	2,791	66	5	21	...
Baylor University Hospital [1-3]	Dallas, Texas	J. W. Duckett	4,141	29	3	9	175
Parkland Memorial Hospital [1-3]	Dallas, Texas	B. Wilson	2,611	27	8	22	150
Veterans Admin. Hospital [1-3-356]	Dallas, Texas	J. P. North	1,736	43	4	12	...
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	R. M. Moore	1,352	28	6	18	160
Baylor University College of Medicine Affiliated Hospitals							
Jefferson Davis Hospital [1-3]	Houston, Texas	M. E. De Bakey	1,972	42	6	20	75
Methodist Hospital [1-3]	Houston, Texas	L. L. D. Tuttle	2,368	54	1	4	220
Veterans Admin. Hospital [1-3]	Houston, Texas	G. L. Jordan, Jr.	1,221	39	8	17	...
Hermann Hospital [1-3]	Houston, Texas	G. W. Waldron	5,467	62	2	8	125
Dr. W. H. Groves Latter-Day Saints Hospital [1-3-259]	Salt Lake City	A. M. Nielsen	6,327	36	3	9	250
Salt Lake County General Hospital [3]	Salt Lake City	W. Burdette	1,144	36	3	12	220
Veterans Admin [illegible]	Salt Lake City	R. C. Richards	1,091	28	2	8	...
University of V [illegible] als							
De Goesbriand [illegible]	Burlington, Vt.	A. A. Gladstone	866	7	1	3	167
Mary Fletcher Hospital [1-3]	Burlington, Vt.	A. G. Mackay	2,312	46	2	8	100
University of Virginia Hospital [1-3]	Charlottesville, Va.	W. H. Muller, Jr.	2,534	96	8	23	50
Chesapeake and Ohio Railway Employees Affiliated Hospitals							
Chesapeake and Ohio Hospital [1-3]	Clifton Forge, Va.	J. M. Emmett	3,822	20	4	10	200
Chesapeake and Ohio Hospital [1-3]	Huntington, W. Va.	J. P. Carey	783	10	..	..	200
De Paul Hospital [1-3]	Norfolk, Va.	C. J. Devine, Jr.	4,303	25	2	5	200
Norfolk General Hospital [1-3]	Norfolk, Va.	R. L. Payne, Jr.	2,641	22	4	8	215
Medical College of Virginia—Hospital Division [1-3]	Richmond, Va.	D. M. Hume	4,505	64	5	23	75
Veterans Admin. Hospital [1-3]	Richmond, Va.	R. F. MacDonald	1,835	22	2	8	...
King County Hospital Unit No. 1 (Harborview) [1]	Seattle	H. N. Harkins	1,746	105	4	15	125
Veterans Admin. Hospital [1-3]	Seattle	J. W. Bell	1,351	57	4	12	...
Virginia Mason Hospital [1-3]	Seattle	J. W. Baker	5,394	91	3	12	150
University Hospitals [1-3]	Madison, Wis.	E. R. Schmidt	2,511	82	6	18	100
Milwaukee County Hospital [1-3]	Milwaukee	J. M. King	6,008	139	8	20	207
Milwaukee Hospital [1-3-378]	Milwaukee	I. Schulz	4,296	37	2	5	270
Veterans Admin. Hospital [1-3]	Milwaukee (Wood), Wis.	M. B. Smith	2,971	81	3	13	...
Queen's Hospital [1-3-388]	Honolulu, T. H.	J. E. Strode	2,978	21	2	7	150
San Juan City Hospital [1-3]	San Juan, P. R.	J. N. Benitez	2,537	43	4	10	150

Numerical and other references will be found on pages 640 through 642.

26. SURGERY—Continued

Residency programs in the following hospitals have been approved by the Council, the American Board of Surgery and the American College of Surgeons, through the Conference Committee on Graduate Training in Surgery, for THREE years of training, designed to qualify the trainee for examination by the American Board of Surgery as a Group II candidate.

Hospitals, 198; Assistant Residencies and Residencies, 1,094

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies Offered *	Beginning Stipend (Month)
UNITED STATES ARMY							
William Beaumont Army Hospital [3]	El Paso, Texas	R. L. Rhea, Jr.	2,266	19	2	6	...
UNITED STATES NAVY							
U. S. Naval Hospital [1-3]	Great Lakes, Ill.	S. Ede	1,811	2	2	3	...
UNITED STATES PUBLIC HEALTH SERVICE							
U. S. Public Health Service Hospital [1-3]	New Orleans	J. L. Elliott	3,240	22	1	5	...
U. S. Public Health Service Hospital [1-3]	Baltimore	H. D. Fishburn	2,968	53	2	6	...
U. S. Public Health Service Hospital	Boston	F. W. Love	2,025	12	1	3	...
U. S. Public Health Service Hospital [1-3]	Stapleton, S. I., N. Y.	P. E. Walker	5,814	51	5	17	...
U. S. Public Health Service Hospital [1-3]	Seattle	J. D. Lane, Jr.	2,418	17	1	3	...
NONFEDERAL AND VETERANS ADMINISTRATION							
Carraway Methodist Hospital [1]	Birmingham, Ala.	B. M. Carraway	983	7	2	4	250
Mobile County Hospital [1-3]	Mobile, Ala.	E. B. Frazier	1,517	27	2	5	275
Veterans Admin. Hospital [1]	Tuskegee, Ala.	J. M. Cox	1,157	32	3	8	...
St. Joseph's Hospital [1-3]	Phoenix, Ariz.	W. A. Brewer	2,532	17	1	3	250
Kern County General Hospital [1]	Bakersfield, Calif.	C. E. Marvin	1,338	61	5	9	325
Herrick Memorial Hospital [1-3]	Berkeley, Calif.	L. E. Brown	2,687	11	1	2	175
Glendale Sanitarium and Hospital [1]	Glendale, Calif.	H. C. Prout	3,910	29	1	3	325
California Hospital [1-3]	Los Angeles	O. D. Lloyd	2,652	24	7	19	225
Hospital of the Good Samaritan [1-3]	Los Angeles	K. W. Blake	2,410	15	2	6	250
Queen of Angels Hospital [1-3]	Los Angeles	J. F. Regan	3,298	49	1	4	200
St. Vincent's Hospital [1-3]	Los Angeles	L. C. Bennett	5,621	28	1	3	350
Mercy Hospital [1-3]	San Diego, Calif.	T. F. O'Connell	2,890	22	1	3	225
St. Joseph's Hospital [1-3]	San Francisco	E. H. Dickinson	2,496	11	1	3	300
St. Luke's Hospital [1-3]	San Francisco	O. Pflueger	5,042	14	3	6	325
St. Mary's Hospital [1-3]	San Francisco	T. J. Whalen	1,776	9	3	8	200
Southern Pacific General Hospital [1-3]	San Francisco	W. L. Newberg	3,122	14	2	9	175
Presbyterian Hospital [1-3-61]	Denver	K. C. Sawyer	1,841	12	1	3	275
St. Luke's Hospital [1-93]	Denver	G. Wollgast-D. Osborne	2,500	34	2	5	225
Colorado State Hospital [1-3-77]	Pueblo, Colo.	H. H. Kerr	621	59	4	7	415
Bridgeport Hospital [1-3]	Bridgeport, Conn.	J. F. Nolan	4,624	50	1	4	240
Hospital of St. Raphael	New Haven, Conn.	O. Pelliccia	3,104	30	4	11	150
St. Mary's Hospital [1-3]	Waterbury, Conn.	J. F. Burke	2,895	24	2	5	225
Doctors Hospital [1-3]	Washington, D. C.	C. S. White	4,322	40	1	3	200
Mount Sinai Hospital of Greater Miami [1-3]	Miami Beach, Fla.	R. M. Fleming	3,699	29	2	5	250
Tampa General Hospital [1]	Tampa, Fla.	W. C. Myers, Jr.	4,805	78	3	7	250
Crawford W. Long Memorial Hospital [1-3]	Atlanta, Ga.	C. E. Holloway	5,339	31	6	10	285
Georgia Baptist Hospital [1]	Atlanta, Ga.	W. S. Dorough	8,595	48	2	7	305
Macon Hospital [1]	Macon, Ga.	C. N. Wasden	2,992	13	..	..	...
American Hospital [1-3]	Chicago	M. Thorek-P. Thorek	2,377	21	5	8	65
Augustana Hospital [1-3]	Chicago	E. Garside	3,592	154	2	5	150
Grant Hospital [1-3]	Chicago	C. K. Solander	2,911	24	1	3	225
Illinois Masonic Hospital [1-3]	Chicago	P. Shambaugh	1,415	14	3	8	115
Lutheran Deaconess Home and Hospital [3]	Chicago	J. D. Koucky	2,506	18	1	3	200
Mercy Hospital [1-3-127]	Chicago	H. A. Oberhelman	2,021	66	4	10	200
Provident Hospital [1-3]	Chicago	C. W. Phillips	2,003	21	1	3	200
St. Elizabeth Hospital [3]	Chicago	C. S. Scuderi	6,523	20	2	3	200
St. Joseph Hospital [1-3]	Chicago	F. B. McCarty	2,525	14	1	3	300
St. Mary of Nazareth Hospital [1-3]	Chicago	E. H. Warszewski	3,316	24	2	6	200
St. Francis Hospital	Peoria, Ill.	C. D. Branch	5,156	38	1	3	225
Clinic Hospital [1-3-141]	Bluffton, Ind.	H. D. Caylor	859	6	1	4	300
Methodist Hospital [1]	Indianapolis	D. Megenhardt	5,324	68	2	6	278
St. Vincent's Hospital [1-3]	Indianapolis	W. D. Gatch	1,884	22	1	3	275
St. Elizabeth Hospital [1-3]	Lafayette, Ind.	R. E. Gery	1,374	8	2	2	275
St. Margaret's Hospital [1]	Kansas City, Kan.	M. V. Laing	8,036	102	1	3	300
St. Francis Hospital [1-3]	Wichita, Kan.	J. W. Graves	4,416	49	3	7	275
Harlan Memorial Hospital [3-152]	Harlan, Ky.	W. F. Potter	1,574	17	2	8	400
Ochsner Foundation Hospital [1-3]	New Orleans	A. Ochsner	1,723	26	4	12	225
Southern Baptist Hospital [1]	New Orleans	W. F. Becker	5,858	35	3	6	225
Touro Infirmary [1]	New Orleans	L. H. Strug	3,823	37	5	6	125
Lutheran Hospital [1-3]	Baltimore	W. E. Gilmore	2,600	17	2	6	220
Provident Hospital and Free Dispensary	Baltimore	B. Harris, Sr.	1,070	18	3	6	225
St. Agnes Hospital [1-3]	Baltimore	G. Govatos	3,512	28	3	6	260
St. Joseph's Hospital [3]	Baltimore	O. C. Brantigan	4,163	49	2	6	225
South Baltimore General Hospital [1-3]	Baltimore	E. D. Weinberg	2,649	22	3	7	150
Beverly Hospital [1-3]	Beverly, Mass.	R. E. Alt	2,363	38	3	8	150
Truesdale Hospital [1-3]—Fall River General Hospital	Fall River, Mass.	C. H. Hawes	2,289	25	1	3	150
Malden Hospital [1-3]	Malden, Mass.	W. E. Garrey	5,995	24	3	6	200
Newton-Wellesley Hospital [1-3-169]	Newton Lower Falls, Mass.	H. G. Dunphy	3,880	29	1	3	200
Leila Y. Post Montgomery Hospital [1-3]	Battle Creek, Mich.	R. A. Stiefel	1,317	8	2	3	275
Alexander Blain Hospital [1-3]	Detroit	A. W. Blain, III	1,657	2	2	5	250
Providence Hospital [1-3]	Detroit	W. G. Quigley	7,170	42	1	3	275
St. Joseph Mercy Hospital [1-193]	Detroit	L. B. Saraf	2,247	10	1	4	310
St. Mary's Hospital [1-3]	Grand Rapids, Mich.	F. Gillett	1,773	10	1	3	275
Bronson Methodist Hospital [1-204]	Kalamazoo, Mich.	C. Hanson	2,121	44	1	4	260
Pontiac General Hospital [1-3]	Pontiac, Mich.	L. C. Sheffield	5,172	61	2	5	325
St. Joseph Mercy Hospital [1-3]	Pontiac, Mich.	C. G. Darling	1,888	12	2	6	325
William Beaumont Hospital [1-3]	Royal Oak, Mich.	H. B. Barker	1,797	13	2	4	300
Saginaw General Hospital [1-3]	Saginaw, Mich.	H. M. Bishop	3,412	39	1	4	365
Mount Sinai Hospital [1-3]	Minneapolis	A. Kremen	1,566	17	2	4	200
St. Barnabas Hospital [1-3]	Minneapolis	N. C. Plimpton	1,531	9	1	3	235
Mayo	Rochester, Minn.	J. M. Waugh	11,180	188	20	74	175
Charle	St. Paul	W. C. Bernstein	3,048	51	1	3	250
Mercy	Vicksburg, Miss.	G. H. Martin	.....	11	1	3	275

Numerical and other references will be found on pages 640 through 642.

26. SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
Vicksburg Hospital [3]	Vicksburg, Miss.	W. H. Parsons	3,539	...	1	4	100
St. Louis County Hospital [1-3]	Clayton, Mo.	D. Sauer	416	17	2	8	225
Kansas City General Hospital No. 2 [1-3]	Kansas City, Mo.	R. E. Allen	831	21	2	6	200
Menorah Medical Center [1-3]	Kansas City, Mo.	A. Adelman	4,743	24	2	6	300
St. Luke's Hospital [1-3-221]	Kansas City, Mo.	J. H. Gaskins	2,209	28	2	5	310
St. Mary's Hospital [1-3]	Kansas City, Mo.	T. M. Johnson	2,796	9	1	3	275
De Paul Hospital [1-3]	St. Louis	J. W. Thompson	5,771	42	3	6	200
Missouri Baptist Hospital [1-3]	St. Louis	A. R. Dalton	2,470	18	3	8	175
St. John's Hospital [1-3]	St. Louis	G. T. Gafney	3,033	61	3	7	200
Veterans Admin. Hospital [1-3-220]	Lincoln, Neb.	S. P. Brown	1,995	28	2	6	...
Atlantic City Hospital [1]	Atlantic City, N. J.	J. H. Mason, III	4,532	73	1	3	200
Cooper Hospital [1-3]	Camden, N. J.	E. R. Ristine	2,893	57	1	3	200
West Jersey Hospital [1-3]	Camden, N. J.	K. Athey	1,572	15	1	3	225
Veterans Admin. Hospital [1-3-230]	East Orange, N. J.	A. Levy	1,517	51	2	8	...
Burlington County Hospital [1-3]	Mount Holly, N. J.	T. J. Summey	1,724	43	2	4	100
Harrison S. Martland Medical Center [1-3]	Newark, N. J.	C. MacArthur	1,384	32	3	9	162
St. Barnabas Medical Center [1-3]	Newark, N. J.	H. A. Schulte	3,352	21	1	4	150
St. Peter's General Hospital [1-3]	New Brunswick, N. J.	F. M. Clarke	1,681	17	1	3	175
Orange Memorial Hospital [1-3]	Orange, N. J.	C. H. Evans	4,755	44	1	4	150
St. Francis Hospital [1-3]	Trenton, N. J.	G. N. J. Sommer, Jr.	6,526	74	2	5	210
St. Peter's Hospital [3]	Albany, N. Y.	T. I. Tyrrell	5,326	36	2	4	225
Beth El Hospital [1-3]	Brooklyn, N. Y.	C. B. Ripstein	3,132	14	3	5	150
Cumberland Hospital [1-3]	Brooklyn, N. Y.	J. J. Gainey	1,925	18	4	8	105
Greenpoint Hospital [1-3]	Brooklyn, N. Y.	S. Schussheim	1,595	33	2	6	105
Lutheran Medical Center [1-3]	Brooklyn, N. Y.	R. P. San Filippo	2,285	26	1	3	135
St. Catherine's Hospital [1-3]	Brooklyn, N. Y.	J. A. McCabe	3,509	15	2	5	125
St. Mary's Hospital [1-3]	Brooklyn, N. Y.	J. Rizzo	2,000	17	1	3	200
Deaconess Hospital [1-3]	Buffalo	E. T. McGroder	4,309	35	4	8	300
Clifton Springs Sanitarium and Clinic [1-3]	Clifton Springs, N. Y.	R. M. Price	655	6	1	3	150
Elmhurst General Hospital [1-3]	Elmhurst, N. Y.	A. Zimany	2,215	24	2	5	105
Jamaica Hospital [1-3]	Jamaica, N. Y.	E. J. Patterson	.....	...	1	4	200
Mary Immaculate Hospital [1-3]	Jamaica, N. Y.	H. W. Draffen	4,057	19	5	8	160
Charles S. Wilson Memorial Hospital [1-3]	Johnson City, N. Y.	D. D. Smith	3,554	30	3	7	225
North Shore Hospital [1-3]	Manhasset, N. Y.	J. H. Eckel	2,217	12	2	6	200
Mount Vernon Hospital [1-3]	Mount Vernon, N. Y.	J. F. Bagg	2,443	27	1	3	125
New Rochelle Hospital [1-3]	New Rochelle, N. Y.	G. C. Adie	7,314	33	1	3	225
Fordham Hospital [1-3]	New York City	B. H. Golden	2,628	44	2	8	105
42nd Street Beth David Hospital [1-3]	New York City	L. Breidenbach	427	3	1	3	...
French Hospital [1-3]	New York City	H. B. Keyes	2,263	31	1	4	75
Morrisania City Hospital [1-3]	New York City	M. Eisenstat	1,263	19	2	6	105
Sydenham Hospital	New York City	S. [illegible]	1,931	5	3	4	104
Ellis Hospital [1-3]	Schenectady, N. Y.	S. [illegible]	5,893	78	4	8	150
White Plains Hospital [1-3]	White Plains, N. Y.	E. [illegible]	3,415	42	1	3	175
Charlotte Memorial Hospital [1]	Charlotte, N. C.	A. G. Brenizer, Jr.	2,135	13	1	3	250
Lincoln Hospital [1-3]	Durham, N. C.	H. M. Schiebel	645	8	1	2	175
Rex Hospital [1]	Raleigh, N. C.	E. H. Herring	2,580	13	1	3	350
City Memorial [illegible]	[illegible] N. C.	H. M. Starling	4,893	30	1	3	300
Aultman Hospital [1-3]	[illegible], Ohio	W. R. Farrar	6,399	50	6	12	275
Mercy Hospital [1-3]	Canton, Ohio	P. E. Smith	3,374	49	4	8	200
Christ Hospital [1]	Cincinnati	E. A. Kindel	2,514	360	2	5	200
Jewish Hospital [1-3-312]	Cincinnati	A. Grollman	6,499	85	5	12	195
Evangelical Deaconess Hospital [1-3]	Cleveland	J. H. Lazzari	1,367	18	4	6	175
St. John's Hospital [1-3]	Cleveland	J. E. Hannibal	3,975	28	2	6	225
Mount Carmel Hospital [illegible]	[illegible] Ohio	W. H. Teachnor	5,228	44	1	3	275
Good Samaritan Hospital	[illegible] Ohio	A. J. Carlson	5,450	18	..	..	270
Miami Valley Hospital [1-3]	Dayton, Ohio	J. M. Shaffer	9,909	138	2	6	200
St. Elizabeth Hospital [1-3]	Dayton, Ohio	T. P. Rab	8,098	54	..	1	325
Marymount Hospital [1-3]	Garfield Heights, Ohio	W. E. Mishler	3,142	17	3	6	200
Lakewood Hospital [1-3]	Lakewood, Ohio	N. W. Thiessen	4,390	25	3	9	200
St. Rita's Hospital [1-3]	Lima, Ohio	C. H. Leech	5,535	36	1	3	400
Maumee Valley Hospital [1-3]	Toledo, Ohio	R. Hotz	430	41	2	4	285
Mercy Hospital [1-3]	Toledo, Ohio	H. L. Hauman	5,708	53	1	4	275
St. Vincent's Hospital [1-3]	Toledo, Ohio	B. G. Shaffer	5,933	72	2	5	325
St. Anthony Hospital	Oklahoma City	L. J. Starry	5,945	39	1	3	300
Hillcrest Medical Center [1]	Tulsa, Okla.	M. Leibovitz	5,687	49	3	6	150
St. John's Hospital	Tulsa, Okla.	R. E. McDowell	2,270	7	2	8	175
Sacred Heart Hospital [1-3]	Allentown, Pa.	C. A. Holland	5,454	49	1	3	225
[illegible] [1-3]	Bethlehem, Pa.	D. P. Walker	5,978	55	3	5	225
[illegible] [1-3]	Erie, Pa.	J. E. O'Brien	5,525	66	1	4	200
[illegible] Hospital	Harrisburg, Pa.	W. K. McBride	5,636	53	3	7	250
[illegible] [1-3]	Norristown, Pa.	R. Buyers	3,254	34	1	3	350
[illegible] Center							
Northern Division	Philadelphia	B. Greenspan	2,516	40	6	12	125
Southern Division	Philadelphia	A. Ulin	2,051	15	2	5	125
Episcopal Hospital [1-3]	Philadelphia	J. W. Klopp	2,245	26	2	6	150
Frankford Hospital [1-3]	Philadelphia	O. P. Large	1,970	167	1	3	250
Mercy-Douglass Hospital [1-3]	Philadelphia	L. C. Manges	1,110	22	1	2	200
Methodist Episcopal Hospital [1-3]	Philadelphia	G Willauer	2,963	21	1	3	150
Nazareth Hospital [1]	Philadelphia	J. F. O'Neill	1,112	8	1	3	200
Philadelphia General Hospital [1-3]	Philadelphia	L. Stahlgren	3,508	141	2	8	121
Montefiore Hospital [1-3]	Pittsburgh	S. A. Rosenburg	5,535	30	1	3	225
St. Francis General Hospital and Rehabilitation Institute [1-3]	Pittsburgh	H. E. Feather	7,892	26	2	4	225
Reading Hospital [1-3]	Reading, Pa.	C. B. Rentschler	1,704	26	1	3	221
St. Joseph's Hospital [1-3]	Reading, Pa.	R. R. Impink	1,240	24	1	3	...
Williamsport Hospital [1-3]	Williamsport, Pa.	F. E. Sanford	2,757	18	1	3	225
Columbia Hospital of Richland County [1]	Columbia, S. C.	G. T. McCutchen	4,204	38	1	3	175
Veterans Admin. Hospital	Columbia, S. C.	K. M. Lippert	858	25	2	6	...
Spartanburg General Hospital [1]	Spartanburg, S. C.	J. V. Jeffords	8,153	41	3	6	200
Sacred Heart Hospital [1-3]	Yankton, S. Dak.	C. B. McVay	1,172	13	1	3	300
Baroness Erlanger Hospital [1-3]	Chattanooga, Tenn.	G. J. Vlasis	2,834	37	8	15	250
University of Tennessee Memorial Research Center and Hospital [1-3]	Knoxville, Tenn.	C. R. Zirkle	1,909	35	2	4	320
Methodist Hospital	Memphis, Tenn.	J. M. Aste	7,174	33	2	6	220

Numerical and other references will be found on pages 640 through 642.

26. SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
St. Joseph Hospital [1-3-252]	Memphis, Tenn.	W. H. Gragg, Jr	1,627	17	1	3	250
Baptist Hospital [1-3]	Nashville, Tenn.	R. G. Hammonds	1,926	5	4	9	300
Brackenridge Hospital [1-3]	Austin, Texas	R. Ross	1,520	16	1	4	200
Methodist Hospital [1-3]	Dallas, Texas	B. E. Park	2,688	10	2	6	200
St. Joseph's Hospital [1-3]	Houston, Texas	J. P. Barnes	1,483	3	2	5	220
Robert B. Green Memorial Hospital [1-3]	San Antonio, Texas	A. W. Hartman	2,430	59	2	6	150
Scott and White Memorial Hospitals [1-3]	Temple, Texas	T. Speed	3,835	21	3	9	300
Johnston Willis Hospital [1-3]	Richmond, Va.	F. S. Johns	3,366	19	1	3	250
Jefferson Hospital [1-3]	Roanoke, Va.	H. H. Trout, Jr.	1,636	7	2	4	175
Swedish Hospital [1-3]	Seattle	E. B. Speir	7,088	34	1	3	225
Beckley Hospital [1-3]	Beckley, W. Va.	H. F. Cooper	2,525	11	2	4	250
Beckley Memorial Hospital [1-3]	Beckley, W. Va.	R. E. Wilcox	1,081	16	2	8	400
Charleston General Hospital [1-3]	Charleston, W. Va.	V. Skaff	3,088	19	2	8	225
Kanawha Valley Hospital [3]	Charleston, W. Va.	J. C. Condry	1,902	10	1	3	200
Memorial Hospital [1-3]	Charleston, W. Va.	B. Bradford, Jr.	1,830	29	2	5	250
Cabell-Huntington Hospital [1-3]	Huntington, W. Va.	W. R. Wilkinson	1,164	6	1	3	250
St. Mary's Hospital [1-3]	Huntington, W. Va.	F. L. Coffey	2,053	16	2	4	275
Veterans Admin. Hospital [1-3]	Martinsburg, W. Va.	I. Harrison	1,606	30	5	6	...
Broaddus Hospital [1-3]	Philippi, W. Va.	H. C. Myers	1,390	23	1	3	300
Ohio Valley General Hospital [1-3]	Wheeling, W. Va.	J. O. Rankin	3,639	33	2	6	300
Madison General Hospital [1-3]	Madison, Wis.	R. P. Sinaiko	3,408	34	1	4	175
Columbia Hospital [1-37a]	Milwaukee	C. M. Schroeder	1,889	37	2	4	245
St. Joseph's Hospital [1-3]	Milwaukee	J. J. Gramling	5,808	54	2	6	280
Gorgas Hospital [3]	Ancon, C. Z.	E. P. Shirokov	2,280	22	2	5	345
Bayamon Charity District Hospital [1-3]	Bayamon, P. R.	R. C. N. Stella	1,704	71	2	5	250
Veterans Admin. Hospital [1-3]	San Juan, P. R.	L. A. Passalacqua	2,027	17	2	6	...

Residency programs in the following hospitals have been approved by the Council, the American Board of Surgery and the American College of Surgeons, through the Conference Committee on Graduate Training in Surgery, for one year of training as an integral part of an approved program of four or more years' duration.

Hospitals, 24; Assistant Residencies and Residencies, 101

NONFEDERAL AND VETERANS ADMINISTRATION

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
Samuel Merritt Hospital [1-72]	Oakland, Calif.	A. J. Hunnicutt	1,994	13	..	..	...
French Hospital [1-3]	San Francisco	W. L. Rogers	3,411	37	3	4	200
Community Hospital of San Mateo County [1]	San Mateo, Calif	K. H. Prindle	352	13	..	1	300
Henrotin Hospital [1-3]	Chicago	C. B. Puestow	1,444	9	1	1	200
Broadlawns-Polk County Hospital [1]	Des Moines, Iowa	W. H. Myerly	1,632	41	..	2	225
Veterans Admin. Hospital [1-3-147]	Wichita, Kan.	A. H. Hinshaw	1,302	41	1	4	...
Lafayette Charity Hospital [1-3]	Lafayette, La.	J. D. Rives	1,696	40	..	2	450
Brockton Hospital	Brockton, Mass.	F. J. Hanley	2,696	27	..	1	250
Mount Auburn Hospital [1-3]	Cambridge, Mass.	J. Tartakoff	3,573	62	1	3	155
Lawrence F. Quigley Memorial Hospital [1-3-166]	Chelsea, Mass.	A. L. Davis	914	13	..	4	255
Salem Hospital [1-3]	Salem, Mass.	W. G. Phippen	1,442	20	..	..	200
Pondville Hospital	Walpole, Mass.	E. M. Daland	1,449	161	..	4	527
St. Joseph's Hospital [1-3]	St. Paul	C. E. Rea	2,922	19	1	2	250
Ellis Fischel State Cancer Hospital [1-3]	Columbia, Mo.	E. J. Schewe, Jr.	1,464	...	..	6	200
Francis Delafield Hospital [1-3]	New York City	G. H. Humphreys, II	764	82	4	14	105
Goldwater Memorial Hospital [1-3-277]	New York City	B. Shafiroff	508	11	2	8	105
Gouverneur Hospital [1-3]	New York City	L. R. Slattery	530	8	..	9	105
Memorial Center for Cancer and Allied Diseases [1-3]	New York City	H. T. Randall	7,564	173	..	23	200
James Ewing Hospital		...	.....	...	..	..	...
Memorial Hosp		...	.....	...	..	..	...
Veterans Admin.		R. W. Postlethwait	1,022	25	3	5	...
Children's Hospit		W. A. Altemeier	1,848	21	..	..	...
Children's Hospital [1]	Columbus, Ohio	H. W. Clatworthy, Jr.	2,064	27	..	4	252
Easton Hospital [1-3]	Easton, Pa.	T. C. Zulick, Jr.	2,082	21	2	2	250
Lynchburg General Hospital [1-3]	Lynchburg, Va.	L. G. Richards, Jr.	1,314	9	..	2	200

Residency programs in the following hospitals have been approved by the Council, the American Board of Surgery and the American College of Surgeons, through the Conference Committee on Graduate Training in Surgery, for additional training following the completion of an approved residency. The American Board of Surgery will give credit for time spent in these services toward fulfillment of the practice requirements for Group II candidates.

Hospitals, 19; Assistant Residencies and Residencies, 98

NONFEDERAL

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
Children's Hospital [1-3]	Denver	H. C. Fisher	1,366	25	3	3	200
Children's Hospital [1-3]	Washington, D. C.	H. H. Schoenfeld	1,427	8	..	..	...
Children's Memorial Hospital [1-3]	Chicago	W. J. Potts	2,784	52	..	2	125
Children's Medical Center	Boston	R. E. Gross	1,506	47	6	11	...
Pondville Hospital	Walpole, Mass.	E. M. Daland	1,449	161	..	4	527
Westfield State Sanatorium [1-3]	Westfield, Mass.	F. S. Hopkins	828	42	..	3	527
Ellis Fischel State Cancer Hospital [1-3]	Columbia, Mo.	E. J. Schewe, Jr.	1,464	...	..	6	200
Children's Hospital [1-3]	Buffalo	L. J. Leahy	2,043	22	..	5	125
Roswell Park Memorial Institute [1-3]	Buffalo	G. E. Moore	3,074	392	..	13	316
Babies' Hospital	New York City	T. V. Santulli	5,460	...	..	1	333
Francis Delafield Hospital [1-3]	New York City	G. H. Humphreys, II	764	82	4	14	105
Memorial Center for Cancer and Allied Diseases [1-3]	New York City	H. T. Randall	7,564	173	..	17	200
James Ewing Hospital		...	.....	...	..	..	...
Memorial Hospital		...	.....	...	..	..	...
Children's Hospital [1]	Columbus, Ohio	H. W. Clatworthy, Jr.	2,064	27	..	4	252
Children's Hospital [1-3]	Philadelphia	C. E. Koop	2,640	25	2	4	67
Children's Hospital [1-3]	Pittsburgh	W. B. Kiesewetter	987	22	..	2	150
Texas Children's Hospital [1-3]	Houston, Texas	L. W. Able	1,326	23	..	1	175
University of Texas—M. D. Anderson Hospital and Tumor Institute [1-3]	Houston, Texas	E. C. White	594	34	..	8	300
Children's Orthopedic Hospital [1-3]	Seattle	H. Coe	2,082	37	..	..	160

Numerical and other references will be found on pages 640 through 642.

26. SURGERY—Continued

Residency programs in the following hospitals are approved by the Council as offering satisfactory training of ONE or TWO years' duration in preparation for residency training in the surgical specialties only. Applicants intending to qualify for examination by the American Board of Surgery should refer to the lists of approved services on pages 626 through 633 (Surgical Residencies, J. A. M. A. 156-432, Sept. 25, 1954).

Hospitals, 126; Assistant Residencies and Residencies, 317.

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
UNITED STATES AIR FORCE							
U. S. Air Force Hospital [1-3]	Wichita Falls, Texas	H. M. Thomas	652	1	2	2	...
UNITED STATES ARMY							
U. S. Army Hospital [1-3]	Fort Benning, Ga.	R. M. Hardaway, III	1,766	17	4	4	...
U. S. Army Hospital [1-3]	Fort Campbell, Ky.	H. J. Grossman	5,573	7	2	2	...
U. S. Army Hospital	Fort Bragg, N. C.	H. A. Conrad	7,478	8	3	3	...
U. S. Army Hospital [1-3]	Fort Belvoir, Va.	D. G. Elsner	6,321	11	4	4	...
Madigan Army Hospital [1-3]	Tacoma, Wash.	W. A. Todd, Jr.	1,637	6	3	3	...
NONFEDERAL							
Good Samaritan Hospital [1]	Phoenix, Ariz.	J. Eisenbeiss	4,421	35	2	2	300
St. Mary's Hospital [1-3]	Tucson, Ariz.	I. M. Chesser	6,759	27	8	8	200
Tucson Medical Center [1-3]	Tucson, Ariz.	P. G. Derickson	991	5	3	3	200
Arkansas Baptist Hospital [1-3]	Little Rock, Ark.	C. E. Wenger	8,135	43	2	4	325
General Hospital of Riverside County [1]	Arlington, Calif.	....	492	9	2	2	444
Seaside Memorial Hospital [1-3]	Long Beach, Calif.	M. C. Todd	6,923	15	3	3	185
Presbyterian Hospital-Olmsted Memorial [1-3]	Los Angeles	W. H. Snyder	4,999	25	1	1	200
Santa Fe Coast Lines Hospital	Los Angeles	L. Chaflin	945	3	2	2	350
Collis P. and Howard Huntington Memorial Hospital [1-3]	Pasadena, Calif.	E. B. Dewey	3,588	13	3	3	300
San Bernardino County Charity Hospital	San Bernardino, Calif.	R. Seavers	870	44	4	5	190
Mary's Help Hospital [1-3]	San Francisco	E. Carlson	1,059	7	1	2	200
St. John's Hospital [1-3]	Santa Monica, Calif.	J. F. Roberts	5,833	18	1	1	200
Greenwich Hospital [1-3]	Greenwich, Conn.	H. P. Serrell	3,629	38	1	1	150
Hartford Municipal Hospital and Health Center [1-3]	Hartford, Conn.	C. Kelly	379	5	2	2	255
Lawrence and Memorial Hospitals [1-3]	New London, Conn.	F. B. Hartman	4,544	29	3	3	250
Norwalk Hospital [1-3]	Norwalk, Conn.	H. Genvert	1,680	11	2	2	195
Stamford Hospital [1-3]	Stamford, Conn.	C. Rawls	2,498	28	..	..	...
Eastern Dispensary and Casualty Hospital [3]	Washington, D. C.	J. R. Young	3,561	15	1	2	350
Sibley Memorial Hospital	Washington, D. C.	P. S. Putzki	.....	..	1	3	200
Riverside Hospital	Jacksonville, Fla.	T. M. Moseley	868	2	1	1	200
St. Luke's Hospital [1-3]	Jacksonville, Fla.	R. P. Thompson	1,981	11	2	2	300
St. Francis Hospital [1-3]	Miami Beach, Fla.	J. T. Jana	3,266	13	2	2	215
Orange Memorial Hospital [1]	Orlando, Fla.	D. C. Robertson	3,515	52	1	3	325
Mound Park Hospital [1]	St. Petersburg, Fla.	W. Rautenstrauch	5,793	71	1	1	290
Memorial Hospital of Chatham County [1-3]	Savannah, Ga.	J. L. Alexander	550	18	1	3	350
Mac Neal Memorial Hospital [1-3]	Berwyn, Ill.	J. L. Grout	1,427	10	2	2	350
Englewood Hospital [3]	Chicago	J. Levenson	2,028	..	1	1	200
Hospital of St. Anthony de Padua [1-3]	Chicago	W. R. Sladek	3,258	13	2	2	250
Norwegian American Hospital	Chicago	G. T. Murphy	3,530	19	3	3	200
Ravenswood Hospital [1-3]	Chicago	J. Abbate	1,223	...	2	2	200
St. Anne's Hospital [1-3]	Chicago	P. F. Fox	4,931	24	2	2	250
Woodlawn Hospital [1-3]	Chicago	H. P. Jenkins	1,011	9	1	1	250
Little Company of Mary Hospital [1-3]	Evergreen Park, Ill.	P. H. McNulty	4,874	33	2	8	175
Community Memorial General Hospital	La Grange, Ill.	R. Stokes	5.424	46	2	2	300
Methodist Hospital of Central Illinois [3]	Peoria, Ill.	W. H. Eastman	5,989	6	2	4	200
St. Anthony Hospital [1-3]	Rockford, Ill.	R. G. Smith	4.070	12	1	3	200
Ball Memorial Hospital [1]	Muncie, Ind.	R. C. Peacock	4,871	35	1	1	250
Mercy Hospital [1-3]	Iowa City	G. Scanlon	4,105	20	2	2	200
Wesley Hospital [1-3]	Wichita, Kan.	L. K. Crumpacker	7,185	20	1	1	310
Good Samaritan Hospital [1-3]	Lexington, Ky.	A. E. Grimes	5,225	39	1	1	225
Hotel Dieu-Sister's Hospital	New Orleans	M. Salatich	2,351	5	2	4	225
Ochsner Foundation Hospital [1-3]	New Orleans	A. Ochsner	1,723	26	4	4	225
Central Maine General Hospital [1]	Lewiston, Maine	W. V. Cox	3,149	45	1	1	225
Bon Secours Hospital [3]	Baltimore	S. G. Sullivan	1,186	5	1	2	270
New England Hospital [1-3]	Boston	A. Brown	1,874	..	2	2	85
Burbank Hospital [1-3]	Fitchburg, Mass.	F. P. Ross	2,277	34	1	2	200
Evangelical Deaconess Hospital [1-3]	Detroit	T. H. Hunt	1,223	20	2	2	307
Jennings Memorial Hospital [1-3]	Detroit	J. B. Hartzell	303	..	2	2	350
Woman's Hospital [1]	Detroit	J. R. Brown	3,203	8	3	3	475
Bon Secours Hospital [3]	Grosse Pointe, Mich.	J. F. Wenzel	1,501	12	1	2	415
Borgess Hospital [1]	Kalamazoo, Mich.	C. G. Callander	2,330	20	1	1	275
Edward W. Sparrow Hospital	Lansing, Mich.	J. M. Wellman	1,646	14	2	2	250
Northwestern Hospital [1-3]	Minneapolis	H. Buchstein	3,876	38	3	3	200
Swedish Hospital [1-3]	Minneapolis	J. H. Linner	8,755	18	3	6	200
Missouri Methodist Hospital [1-3]	St. Joseph, Mo.	J. N. Martin	4,174	23	3	3	225
St. Anthony's Hospital [1-3]	St. Louis	A. Repetto	3,967	14	1	1	260
St. Elizabeth Hospital [1-3]	Lincoln, Neb.	R. F. Mueller	4,310	17	2	4	300
Hackensack Hospital [1-3]	Hackensack, N. J.	A. I. Mader, Jr.	4,124	35	1	3	150
Monmouth Memorial Hospital [1-3]	Long Branch, N. J.	H. Kazmann	3,062	37	3	4	200
Mountainside Hospital [1-3]	Montclair, N. J.	C. W. Moeckel	5,223	20	1	1	250
Morristown Memorial Hospital [1-3]	Morristown, N. J.	R. F. Zimmerman	4,853	67	1	1	185
Fitkin Memorial Hospital [1-3]	Neptune, N. J.	M. Q. Hancock	3,585	40	2	2	200
United Hospitals of Newark *Presbyterian Hospital* [1-3]	Newark, N. J.	P. A. O'Connor	4,785	48	3	3	175
Columbus Hospital [3]	New York City	V. Carabba	1,494	..	1	3	125
Hospital for Joint Diseases [1-3]	New York City	P. Klingenstein	973	8	4	4	80
Jewish Memorial Hospital [1-3]	New York City	B. Sherwin	1,813	32	1	1	150
Lebanon Hospital [1-3]	New York City	B. Sherwin-C. B. Ripstein	1,692	9	1	1	100
Misericordia Hospital [1-3]	New York City	M. J. Healy	1,910	12	1	2	125
Mother Cabrini Memorial Hospital [1-3]	New York City	J. P. Alvich	1,201	6	1	3	125
New York Infirmary [1-3]	New York City	L. Loseke	1,309	11	1	2	150
United Hospital [1-3]	Port Chester, N. Y.	G. O. Tremble	2,173	36	2	2	200
St. Agnes Hospital [1]	Raleigh, N. C.	G. W. Paschal	722	3	1	1	400
Kate Bitting Reynolds Memorial Hospital [1-3]	Winston-Salem, N. C.	H. R. Malloy	3,493	16	1	2	300
Bismarck Hospital [3]	Bismarck, N. Dak.	R. H. Waldschmidt	774	6	3	3	300

Numerical and other references will be found on pages 640 through 642.

26. SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [a]	Total Residencies Offered [a]	Beginning Stipend (Month)
St. Luke's Hospital [3]	Fargo, N. Dak.	V G. Borland	1,176	7	2	2	200
Deaconess Hospital [1-3]	Cincinnati	R W [illegible]	3,359	7	3	3	175
Fairview Park Hospital [1-3]	Cleveland	R J. [illegible]	2,167	12	2	6	200
Mercy Hospital [1-3]	Hamilton, Ohio	W F [illegible]	2,730	23	3	9	200
Lima Memorial Hospital [1-3]	Lima, Ohio	R. R Snowball	5,234	25	1	1	275
Mansfield General Hospital [1-3]	Mansfield, Ohio	P S Test	3,268	14	4	4	200
Flower Hospital [1-3]	Toledo, Ohio	W. H Meffley	4,113	72	1	1	300
Trumbull Memorial Hospital [1]	Warren, Ohio	D A Miller	4,656	46	1	3	200
Wesley Hospital [1]	Oklahoma City	A H Bell	1,354	14	2	2	250
Emanuel Hospital [1-3]	Portland, Ore	F H Bentley	3,587	35	2	4	275
Good Samaritan Hospital [1-3]	Portland, Ore.	F. A Short	1,749	16	3	3	275
Providence Hospital [1-3]	Portland, Ore.	J. C Adams	6,724	67	2	2	275
Altoona Hospital [1-3]	Altoona, Pa.	F. I. Taylor	2,295	37	1	1	325
Bradford Hospital [1-3]	Bradford, Pa.	S. A. McCutcheon	935	8	..	2	250
Hazleton State Hospital [1-3]	Hazleton, Pa.	J P H Kettrick	2,452	16	3	4	353
St. Joseph's Hospital [1-3]	Philadelphia	J. A. Lehman	3,497	26	4	4	300
St. Mary's Hospital [3]	Philadelphia	W. J Tourish	1,218	8	2	2	250
Woman's Hospital [3]	Philadelphia	C Smyth	1,318	3	1	2	175
St. Margaret Memorial Hospital [1-3]	Pittsburgh	J. R. Watson	1,886	17	1	1	300
Mercy Hospital [1]	Wilkes Barre, Pa.	L. C. Blaum	2,803	4	1	1	250
Wilkes-Barre General Hospital [1-3]	Wilkes-Barre, Pa.	P. J Morgan	2,615	17	2	2	225
Columbia Hospital [1-3]	Wilkinsburg, Pa.	W B Hetzel	4,096	35	2	2	460
Memorial Hospital [1-3]	Chattanooga, Tenn	F. B Graham, III	3,049	11	4	4	250
Newell Hospital [3]	Chattanooga, Tenn.	E T. Newell, Jr.	2,218	12	3	3	300
St. Mary's Memorial Hospital [1-3]	Knoxville, Tenn.	C. L Chumley	3,165	21	1	2	250
Gaston Hospital [1-3]	Dallas, Texas	J V. Goode	1,926	14	4	4	250
Harris Hospital [1]	Fort Worth, Texas	A. F. Kauffmann	6,965	39	1	2	300
Southern Pacific Hospital [3]	Houston, Texas	J. R. Gandy	460	2	2	2	...
Baptist Memorial Hospital [1-3]	San Antonio, Texas	R. F. Gossett	5,962	34	1	1	150
Thomas D. Dee Memorial Hospital [1]	Ogden, Utah	G. H. Lowe	4,172	23	2	2	325
Holy Cross Hospital [1-3]	Salt Lake City	E. H. Phillips	4,281	40	4	4	175
St. Mark's Hospital [1-3]	Salt Lake City	J. H. Clark	5,233	35	2	2	275
Riverside Hospital [1-3]	Newport News, Va.	F. A. Carmines	2,469	3	..	..	...
Richmond Memorial Hospital [1]	Richmond, Va.	H. J Warthen	1,574	9	2	2	300
St. Elizabeth's Hospital	Richmond, Va.	G. W. Horsley	922	2	2	3	200
Lewis-Gale Hospital [1-3]	Roanoke, Va	W. L. Sibley	2,696	6	2	2	350
Doctors Hospital [1-3]	Seattle	A. W. Lobb	5,001	36	1	2	250
Providence Hospital [1-3]	Seattle	A. H. Bill, Jr.	2,486	8	2	2	215
Sacred Heart Hospital [3]	Spokane, Wash	D. G. Corbett	10,852	63	3	3	250
Laird Memorial Hospital [1-3]	Montgomery, W. Va.	W. R. Laird	1,934	4	1	1	300
Mercy Hospital [1-3]	Janesville, Wis.	E. Reinardy	1,263	4	4	4	250
La Crosse Lutheran Hospital [1-3]	La Crosse, Wis	S B. Gundersen	3,989	51	2	2	300
Methodist Hospital [1-3]	Madison, Wis.	O. F. Foseid	5,349	79	1	2	200
St. Joseph's Hospital	Marshfield, Wis.	B. R. Lawton	1,195	12	2	2	350
Evangelical Deaconess Hospital [1-3]	Milwaukee	H. B. Benjamin	1,400	29	4	6	250
St. Luke's Hospital [1-3]	Milwaukee	R. E. Galasinski	2,944	39	3	3	275

27. THORACIC SURGERY

Residency programs in the following hospitals have been approved by the Council and the Board of Thoracic Surgery, as offering acceptable training in the specialty.

Hospitals, 99; Assistant Residencies and Residencies, 241

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [a]	Total Residencies Offered [a]	Length of Approved Program (Years)	Beginning Stipend (Month)
UNITED STATES ARMY								
Letterman Army Hospital [1-3]	San Francisco	S. French, III	118	6	1	2	2	...
Fitzsimons Army Hospital [1-3]	Denver	J. M. Salyer	71	7	1	2	2	...
Army Medical Center [1-3]	Washington, D. C.	J. H. Forsee	183	7	1	2	2	...
UNITED STATES NAVY								
U. S. Naval Hospital [1]	San Diego, Calif.	J. M. Hanner	229	11	1	2	2	...
U. S. Naval Hospital [1]	St. Albans, N. Y.	J. J. Timmes	230	..	2	3	2	...
NONFEDERAL AND VETERANS ADMINISTRATION								
University of Alabama Medical Center University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	C. Lyons	...	..	11	9	2	50
City of Hope Medical Center [1-3]	Duarte, Calif.	A. Goldman	393	27	1	1	1	400
Veterans Admin. Hospital [1-3]	Los Angeles	F. X. Byron	330	44	..	2	2	...
Highland-Alameda County Hospital [1-3-72]	Oakland, Calif.	D. Dugan	326	5	2	3	2	200
Harbor General Hospital [1]	Torrance, Calif.	A. J. Beland	77	2	1	2	2	246
National Jewish Hospital [1-3]	Denver	J. B. Grow	414	3	1	2	2	260
Veterans Admin. Hospital [1-3]	Denver		...	..	..	..	2	...
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	G. E. Lindskog	494	7	..	1	2	240
Hospital of St. Raphael	New Haven, Conn.	M. G. Carter	263	9	1	2	2	150
Cedarcrest Hospital [1-3]	Newington, Conn.	R. L. Kemler	206	..	1	1	1	335
Uncas-on-Thames [1-3]	Norwich, Conn.	W. O. Kelley	489	7	1	1	1	350
George Washington University Hospital [1-3]	Washington, D. C.	B. Blades	492	14	1	2	2	150
Medical College of Georgia Hospitals Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga.	R. G. Ellison	220	19	..	2	2	250
Emory University Hospital [1-3]	Emory University, Ga.	O. A. Abbott	776	18	..	4	2	255
Chicago State Tuberculosis Sanitarium [1-3]	Chicago	H. T. Langston	421	2	2	2	1	300
Children's Memorial Hospital [2-3]	Chicago	W. J. Potts	Incl. in Surgery		..	1	1	125
City of Chicago Municipal Tuberculosis Sanitarium [1-3]	Chicago	W. M. Lees	604	8	..	9	1	185

Numerical and other references will be found on pages 640 through 642.

27. THORACIC SURGERY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered[8]	Total Residencies Offered[8]	Length of Approved Program (Years)	Beginning Stipend (Month)
Northwestern University Medical Center								
Veterans Admin. Research Hospital [1-3]	Chicago	F. W. Preston	180	6	..	1	2	...
Veterans Admin. Hospital [1-3]	Hines, Ill.	H. T. Langston	296	22	2	4	2	...
Suburban-Cook County Tuberculosis Hospital [1]	Hinsdale, Ill.	A. F. Reimann	342	2	..	1	1	400
State University of Iowa Hospitals [1-3]	Iowa City	J. H. Ehrenhaft	Incl. in Surgery		2	2	2	415
University of Kansas Medical Center [1-3]	Kansas City, Kan.	F. Allbritten, Jr.	269	18	1	2	2	125
Charity Hospital of Louisiana								
Louisiana State University Unit [1]	New Orleans	L. H. Strug	180	11	1	2	2	175
Tulane University Unit [1]	New Orleans	O. Creech	214	10	..	1	2	175
Confederate Memorial Medical Center [1]	Shreveport, La.	W. W. McCook	226	5	..	1	2	300
University Hospital [1]	Baltimore	R. A. Cowley	189	10	3	7	2	75
Boston City Hospital [1-3]	Boston	J. W. Strieder	321	21	..	3	2	182
Boston Sanatorium [1-3]	Boston	J. W. Strieder	157	4	1	3	1	223
New England Deaconess Hospital [1-3]	Boston	R. H. Overholt	197	12	2	4	2	200
University Hospital [1-3]	Ann Arbor, Mich.	C. Haight	706	27	3	7	2	195
Henry Ford Hospital [1-3]	Detroit	C. Lam	127	9	3	6	2	250
Herman Kiefer Hospital [1-3]	Detroit	W. M. Tuttle	1,006	4	4	7	2	554
Ingham Chest Hospital	Lansing, Mich.	C. J. Stringer	702	11	1	2	2	300
Veterans Admin. Hospital [1-3]	Minneapolis	D. J. Ferguson	148	22	1	1	2	...
Mayo Foundation	Rochester, Minn.	O. T. Clagett	Incl. in Surgery		3	6	2	175
University Hospital [1]	Jackson, Miss.	J. D. Hardy	150	3	..	2	2	300
Mississippi State Sanatorium [1-3]	Sanatorium, Miss.	W. R. Webb	214	3	1	1	1	...
Missouri State Sanatorium [1-3]	Mount Vernon, Mo.	J. W. Polk	Incl. in Pul. Disease		2	3	1	400
Barnes Hospital [2-3]	St. Louis	T. Burford	631	26	..	4	2	75
B. S. Pollak Hospital for Chest Diseases [1-3]	Jersey City, N. J.	F. Bortone	113	4	2	2	2	166
Albany Hospital [1-4]	Albany, N. Y.	A. Stranahan	748	23	1	2	2	160
Kings County Hospital								
Division I [1-3]	Brooklyn, N. Y.	E. H. Griffin	214	10	1	2	2	105
Division II [1-3]	Brooklyn, N. Y.	M. Newman	219	6	1	2	2	105
Veterans Admin. Hospital [1-3-264]	Brooklyn, N. Y.	R. Klopstock	427	4	1	2	2	...
Buffalo General Hospital [1-3]	Buffalo	J. R. Paine	150	5	2	4	2	175
Edward J. Meyer Memorial Hospital [1-3]	Buffalo	J. D. Stewart	169	7	..	2	2	247
Veterans Admin. Hospital [1-3]	Buffalo	W. M. Chardack	246	6	1	2	2	...
Veterans Admin. Hospital [1-3]	Castle Point, N. Y.	R. Douglass	135	3	..	2	1	...
Triboro Hospital [1-3]	Jamaica, N. Y.	L. Miscall	143	19	3	5	2	157
Mount Morris Tuberculosis Hospital [1-3]	Mount Morris, N.Y.	J. M. Judd	132	2	2	2	1	537
Bellevue Hospital Center								
Div. I—Columbia University [1-3-252]	New York City	R. H. Wylie	306	8	2	4	2	105
Bronx Municipal Hospital Center [1-3]	New York City	C. B. Ripstein	53	5	2	4	2	175
Montefiore Hospital [1-3]	New York City	A. H. Aufses	168	5	..	1	1	187
New York Medical College-Metropolitan Medical Center								
Metropolitan Hospital [1-3]	New York City	S. A. Thompson	125	..	1	2	1	105
St. Joseph's Hospital for Chest Diseases [1-3]	New York City	W. W Fischer	285	3	1	2	1	300
Veterans Admin. Hospital (Bronx) [1-3-282]	New York City	K. C. Sze	138	3	1	2	2	...
Veterans Admin. Hospital (Manhattan) [1-3]	New York City	H. Stern	250	12	2	4	2	...
Homer Folks Tuberculosis Hospital [1-3]	Oneonta, N. Y.	A. M. Skinner	162	2	2	2	1	537
Ray Brook State Tuberculosis Hospital [1-3]	Ray Brook, N. Y.	D. V. Pecora	258	..	2	2	1	537
Sea View Hospital [1-3-294]	Staten Island, N. Y.	L. R. Davidson	172	6	4	4	1	157
Veterans Admin. Hospital [1-3]	Sunmount, N. Y.	A. M. Decker, Jr.	606	2	..	1	1	...
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	R. M. Peters	236	12	.	1	1	266
Charlotte Memorial Hospital [1]	Charlotte, N. C.	A. G. Brenizer, Jr.	214	11	1	2	2	250
Duke Hospital [1-3]	Durham, N. C.	W. C. Sealy	576	12	..	..	2	...
Veterans Admin. Hospital [1]	Oteen, N. C.	H. E. Walkup	631	43	.	4	2	...
North Carolina Baptist Hospital [1-3-304]	Winston-Salem, N. C.	H. H. Bradshaw	281	13	1	1	2	166
Cleveland Clinic Hospital [1-3]	Cleveland	D. B. Effler	417	22	..	4	2	250
Cuyahoga County Hospital [1-3]	Cleveland	G. H. A. Clowes, Jr.	98	8	..	2	2	162
Veterans Admin. Hospital [1-3-317]	Cleveland	H. J. Mendelsohn	131	5	1	2	2	...
Benjamin Franklin Hospital [1-3]—Mount Carmel Hospital [1-3]	Columbus, Ohio	M. G. Buckles	877	25	2	2	2	275
Ohio State University Hospitals								
Ohio Tuberculosis Hospital [1-3]	Columbus, Ohio	N. C. Andrews	132	6	..	..	2	277
University Hospital [1-3]	Columbus, Ohio	K. P. Klassen	608	21	..	2	2	277
University of Oregon Medical School Hospitals and Clinics [1-3]	Portland, Ore.	W. S. Conklin	300	9	1	2	2	125
Episcopal Hospital [1-3]	Philadelphia	R. P. Glover-T. J. E. O'Neill	88	10	1	2	1	160
Hahnemann Medical College and Hospital [1-3]	Philadelphia	C. P. Bailey	1,134	67	3	5	2	75
Philadelphia General Hospital [1-3]	Philadelphia	E. Mendelsohn	Incl. in Surgery		..	1	1	250
Presbyterian Hospital [1-3]	Philadelphia	R. P. Glover	238	16	2	2	1	225
Health Center Hospitals of the University of Pittsburgh School of Medicine		E. M. Kent	1,036	36	2	4	3	200
Allegheny General Hospital [1]	Pittsburgh		....	..	..	..	..	...
Children's Hospital	Pittsburgh		....	..	..	..	..	...
Presbyterian Hospital	Pittsburgh		....	..	..	..	..	...
Veterans Admin. Hospital [1-3]	Memphis, Tenn.	F. A. Hughes	522	37	2	2	2	...
West Tennessee Tuberculosis Hospital [1-3]	Memphis, Tenn.	F. H. Cole	357	4	2	4	2	245
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	R. A. Daniel	277	15	..	1	2	50
Baylor University Hospital [1-3-30]	Dallas, Texas	R. Shaw	627	14	2	2	2	200
Veterans Admin. Hospital [1-3]	Dallas, Texas	R. H. Holland	284	26	1	2	2	...
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	A. W. Harrison	233	4	1	2	2	160
Baylor University College of Medicine Affiliated Hospitals			.. ..	..	..	..	2	...
Jefferson Davis Hospital [1-3]	Houston, Texas	M. E. De Bakey	Incl. in Surgery		1	2	..	125
Methodist Hospital [1-3]	Houston, Texas	L. L. D. Tuttle	184	22	..	..	..	220
Veterans Admin. Hospital [1-3]	Houston, Texas	M. E. De Bakey	312	36	1	2	..	...
Dr. W. H Groves Latter-Day Saints Hospital [1-3]	Salt Lake City	W. R. Rumel	450	10	..	1	2	325
University of Virginia Hospital [1-3]	Charlottesville, Va.	E. C. Drash	629	7	1	2	2	50
Veterans Admin. Hospital [1-3-372]	Richmond, Va.	L. H. Bosher, Jr.	241	12	1	2	2	...
Firland Sanatorium [1-3]	Seattle	F. J. Jarvis	190	5	..	1	1	300
Veterans Admin. Hospital [1-3]	Milwaukee (Wood), Wis.	W. Weisel	222	18	1	1	2	...
Leahi Hospital [1-3]	Honolulu, T. H.	P. W. Gebauer	....	2	1	1	1	400

Numerical and other references will be found on pages 640 through 642.

28. UROLOGY

Residency programs in the following hospitals have been approved by the Council and the American Board of Urology, through the Residency Review Committee for Urology. These programs are approved for THREE years of training. All hospitals listed offer three years of training intramurally or on an integrated basis through affiliation with another approved institution.

Hospitals, 230; Assistant Residencies and Residencies, 721

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
UNITED STATES ARMY							
Letterman Army Hospital [1-3]	San Francisco	E. Lewis	836	8	1	3	...
Army Medical Center [1-3]	Washington, D. C.	J. F. Patton	465	12	2	6	...
Brooke Army Hospital [1-3]	San Antonio, Texas	L. K Mantell	1,005	11	2	6	...
Tripler Army Hospital [1-3]	Honolulu, T. H.	C. A. Moore	996	...	1	3	...
UNITED STATES NAVY							
U. S. Naval Hospital [1-3]	Oakland, Calif.	M. S. Curtis	745	3	..	1	...
U. S. Naval Hospital [1]	San Diego, Calif.	J. R. Dillon, Jr.	1,205	7	..	1	...
U. S. Naval Hospital [1-3]	Bethesda, Md.	J. S. Hanten	643	...	1	3	...
U. S. Naval Hospital [1-3]	Philadelphia	R. P. Black	492	11	1	1	...
UNITED STATES PUBLIC HEALTH SERVICE							
U. S. Public Health Service Hospital [1-3]	Stapleton, S. I., N. Y.	C. D Miller	1,067	9	2	5	...
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE							
Freedmen's Hospital [1-3]	Washington, D. C.	R. F. Jones	393	9	1	3	308
NONFEDERAL AND VETERANS ADMINISTRATION							
Carraway Methodist Hospital [1]	Birmingham, Ala.	H. C. Hudson	559	...	1	1	250
University of Alabama Medical Center							
University Hospital and Hillman Clinic [1-3]	Birmingham, Ala.	B. Barelare	339	3	1	4	108
Veterans Admin. Hospital [1-3]	Birmingham, Ala.	F. D. Howard	277	3	1	1	...
University Hospital [1-3]	Little Rock, Ark.	J. Headstream	275	3	1	4	155
Kern County General Hospital [1]	Bakersfield, Calif.	S. G. Kearney	191	6	1	2	325
Veterans Admin. Hospital [1-3]	Long Beach, Calif.	A. J. Bischoff	655	16	1	3	...
Kaiser Foundation Hospital	Los Angeles	J. F. Cooper	1,025	1	1	2	275
Los Angeles County Hospital [1]	Los Angeles	R Barnes	2,641	86	2	8	246
University of California Medical Center							
University Hospital [1-3]	Los Angeles	W. E. Goodwin	485	10	1	4	229
Veterans Admin. Hospital [1-3]	Los Angeles	W. Goodwin	1,276	66	2	7	...
Harbor General Hospital [1]	Torrance, Calif.	M. Ellik	301	6	1	4	246
College of Medical Evangelists Affiliated Hospitals							
White Memorial Hospital [1-3-9-85]	Los Angeles	R. W. Barnes	432	4	1	3	215
Presbyterian Hospital—Olmsted Memorial [1-3-9]	Los Angeles	C. Rusche	1,108	5	1	1	200
y Hospital [1-3]	Oakland, Calif.	H. Kay	504	8	1	2	200
il Hospital [1-3]	San Diego, Calif.	E. Le Duc	318	8	1	3	250
Hospital [1-3]	San Francisco	T. E. Gibson	454	3	1	2	175
pitals							
: (Stanford	San Francisco	W. A. Sumner	294	8	1	2	205
Stanford University Hospital [1-3]	San Francisco	H. Weyrauch	433	3	1	2	100
University of California Hospitals							
Franklin Hospital [1]	San Francisco	J. Schulte	308	4	..	..	...
San Francisco Hospital (University of California Service) [1]	San Francisco	S. Olsen	294	9	1	2	205
University of California Hospital [1]	San Francisco	D. R. Smith	526	10	2	6	231
Santa Clara County Hospital [1-3]	San Jose, Calif.	L. J. Pingree	319	14	..	1	260
Veterans Admin. Hospital [1-3-86]	San Francisco	H. M. Weyrauch-D. R. Smith	300	14	1	3	...
University of Colorado Medical Center							
Colorado General Hospital [1-3]	Denver	D. E. Newland	329	5	1	3	180
Denver General Hospital [1-3]	Denver	D. E. Newland	277	10	..	..	179
Veterans Admin. Hospital [1-3]	Denver	O. G. Stonington	361	14	..	1	...
Grace-New Haven Community Hospital [1-3]	New Haven, Conn.	B. M. Harvard	998	10	..	3	140
Veterans Admin. Hospital [1-3]	West Haven, Conn.	J. F. Walsh	444	5	..	1	...
Waterbury Hospital [1]	Waterbury, Conn.	C. H. Neuswanger	603	1	1	2	225
Delaware Hospital [1-3]	Wilmington, Del.	B. S. Vallett	507	15	1	3	220
District of Columbia General Hospital [1-3]	Washington, D. C.	R. Baker-L. Culbertson	179	6	1	3	233
Veterans Admin. Hospital [1-3-115]—Georgetown University Hospital [1-3]	Washington, D. C.	J. G. Lee-R. Baker	682	11	..	4	210
Duval Medical Center [1-3]—St. Vincent's Hospital [3]	Jacksonville, Fla.	W. A. Van Nortwick	1,097	17	1	3	175
Jackson Memorial Hospital [1-3]	Miami, Fla.	G. Prout	860	25	2	6	75
Orange Memorial Hospital [1]	Orlando, Fla.	F. J. Pyle	1,382	20	1	3	325
Grady Memorial Hospital [1]	Atlanta, Ga.	M. K. Bailey	572	8	2	6	125
St. Joseph's Infirmary [1-3]	Atlanta, Ga.	H. P. McDonald	996	4	1	3	270
Veterans Admin. Hospital [1-3-123]	Atlanta, Ga.	E. Haltiwanger	368	2	1	3	...
Medical College of Georgia Hospitals							
Eugene Talmadge Memorial Hospital [1-3]	Augusta, Ga.	R. Rinker	207	7	2	4	250
University Hospital [1]	Augusta, Ga.	W. Lucas	651	5	..	1	200
Memorial Hospital of Chatham County [1-3]	Savannah, Ga.	C. L. Prince	488	7	1	3	350
Cook County Hospital	Chicago	W. J. Baker	1,780	26	2	4	140
Mercy Hospital [1-3]	Chicago	H E. Landes	892	6	1	2	200
Michael Reese Hospital [1-3]	Chicago	I. Shapiro	914	11	1	3	125
Mount Sinai Hospital [1-3]	Chicago	L. A. Maslow	513	1	1	3	225
Northwestern University Me		V. J. O'Conor	.....	...	..	..	...
Chicago Wesley Memorial			792	7	1	2	125
Veterans Admin. Researcl			432	6	..	1	...
Presbyterian-St. Luke's Hospital							
Presbyterian Hospital Division [1-3]	Chicago	N. J. Heckel	629	7	1	3	125
St. Luke's Hospital Division [1-3]	Chicago	T. P. Grauer	755	12	1	1	125
University of Chicago Clinics [1-3]	Chicago	C. W. Vermeulen	605	27	1	4	200
University of Illinois Research and Educational Hospitals [1-3]	Chicago	J. H. Kiefer	363	16	..	1	140
Veterans Admin. Hospital [1-3-139]	Hines, Ill.	F. Lloyd	992	20	4	6	...

Numerical and other references will be found on pages 640 through 642.

28. UROLOGY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered [8]	Total Residencies Offered [8]	Beginning Stipend (Month)
Indiana University Medical Center		...	.....	...	2	6	...
Indianapolis General Hospital [1-3]	Indianapolis	R. D. Howell	334	8	..	..	205
Indiana University Medical Center Hospital [1-391]	Indianapolis	R. Garrett	335	11	..	..	165
Veterans Admin. Hospital [1-3]	Indianapolis	E. Rupel	375	103	..	..	...
Methodist Hospital [1]	Indianapolis	M. Nourse	2,170	15	1	2	278
Veterans Admin. Hospital [1-3-47-390]	Des Moines, Iowa	L. J. Arduino	926	18	1	3	...
State University of Iowa Hospitals [1-3]	Iowa City	R. H. Flocks	2,063	39	3	9	175
University of Kansas Medical Center							
University Hospital [1-3]	Kansas City, Kan.	W. Valk	841	6	2	6	125
Veterans Admin. Hospital [1-3]	Kansas City, Mo.	...	239	9	..	..	...
St. Joseph Hospital [3]—Good Samaritan Hospital [1-3]	Lexington, Ky.	E. H. Ray	660	4	1	3	230
University of Louisville Medical Center							
Louisville General Hospital [1-3]	Louisville, Ky.	R. Lich, Jr.	288	7	1	3	105
Veterans Admin. Hospital [1-3]	Louisville, Ky.	H. I. Berman	365	6	..	1	...
Charity Hospital of Louisiana							
Independent Unit [1]	New Orleans	H. L. Zengel, Jr.	502	8	1	3	100
Louisiana State University Unit [1]	New Orleans	H. T. Beacham	970	14	2	6	100
Tulane University Unit [1]	New Orleans	E. Burns	1,371	26	3	7	100
Ochsner Foundation Hospital [1-3-151]	New Orleans	E. Burns	534	2	1	3	225
Veterans Admin. Hospital [1-3-10]	New Orleans	E. Burns	405	12	1	2	...
Touro Infirmary [1-10]	New Orleans	G. C. Tomskey	923	8	1	1	125
Confederate Memorial Medical Center [1]	Shreveport, La.	R. K. Womack	1,124	8	1	4	125
Johns Hopkins Hospital [1-3-165]	Baltimore	W. W. Scott	1,002	12	4	7	160
Sinai Hospital [1-3-49]	Baltimore	B. S. Abeshouse	631	11	2	5	110
Fordham Hospital [1-3-49]	New York City	L. V. Smiley	225	9	..	..	105
University Hospital [1]	Baltimore	J. D. Young	871	10	2	6	75
Veterans Admin. Hospital [1-3]	Fort Howard, Md.	H. J. Meisel	160	4	..	1	...
Beth Israel Hospital [1-3]	Boston	G. Prather	398	4	1	2	167
Boston City Hospital [1-3]	Boston	F. G. Sheddan, Jr.	610	9	..	5	182
Massachusetts General Hospital [1-3]	Boston	W. F. Leadbetter	1,689	...	1	3	67
Massachusetts Memorial Hospitals [1-3-175]	Boston	D. B. Stearns	378	2	1	3	175
New England Center Hospital [1-3]	Boston	...	....	...	..	..	...
Peter Bent Brigham Hospital [1-3-11]	Boston	J. H. Harrison	Incl. in Surgery		..	3	62
Veterans Admin. Hospital [1-3-11]	West Roxbury, Mass.	H. S. Talbot	248	2	2	3	...
Veterans Admin. Hospital [1-3-184]	Boston (Jamaica Plain)	R. Chute	869	13	1	3	...
University Hospital [1-3-191]	Ann Arbor, Mich.	R. M. Nesbit	1,267	7	3	9	195
Grace Hospital [1-3]	Detroit	M. N. Stewart	1,371	5	1	3	275
Harper Hospital [1-3]	Detroit	F. B. Bicknell	1,505	12	1	3	300
Henry Ford Hospital [1-3]	Detroit	A. W. Bohne	983	6	2	6	250
Receiving Hospital [1-3]	Detroit	D. J. Jaffar	764	17	2	6	303
Wayne County General Hospital and Infirmary [1-3]	Eloise, Mich.	W. L. Sherman	441	19	..	3	386
Minneapolis General Hospital-St. Mary's Hospital	Minneapolis	T. H. Sweetser, Sr.	1,429	20	1	5	220
University of Minnesota Hospitals [1-3-206]	Minneapolis	C. D. Creevy	814	12	1	3	209
Veterans Admin. Hospital [1-3]	Minneapolis	C. D. Creevy	521	19	..	3	...
Mayo Foundation	Rochester, Minn.	G. J. Thompson	3,185	19	5	20	175
Ancker Hospital [1-3]—Charles T. Miller Hospital [1-3]	St. Paul	F. E. B. Foley-B. J. McGroarty	927	20	1	4	220
University of Mississippi Medical Center							
University Hospital [1]	Jackson, Miss.	T. [illegible]	269	..	1	3	250
Veterans Admin. Hospital [1-3]	Jackson, Miss.	S. [illegible]	360	4	..	..	...
Kansas City General Hospital No. 1 [1-3]	Kansas City, Mo.	A. [illegible]	369	9	1	3	200
Barnes Hospital [1-3]	St. Louis	J. J. Cordonnier	1,146	11	2	6	75
Homer G. Phillips Hospital [1-3]	St. Louis	M. Abrams	365	10	..	6	226
Missouri Pacific Hospital [3]	St. Louis	A. E. Vitt	527	4	1	3	200
St. Louis City Hospital [1-3]	St. Louis	C. A. Wattenberg-W. P. Melick	334	23	1	4	234
St. Mary's Group of Hospitals [1-3]	St. Louis	C. E. Burford	717	10	1	3	100
Veterans Admin. Hospital [1-3]	St. Louis	J. P. Altheide	383	5	1	3	...
Dartmouth Medical School Affiliated Hospitals		W. L. McLaughlin	922	8	1	3	218
Mary Hitchcock Memorial Hospital [1-3]	Hanover, N. H.	...	....	...	..	..	...
Veterans Admin. Hospital [1-3]	White River Jct., Vt.	...	.....	...	..	..	...
Veterans Admin. Hospital [1-3-237]	East Orange, N. J.	M. Malament	539	14	..	2	...
Jersey City Medical Center [50]	Jersey City, N. J.	E. J. Daly	854	2	1	3	145
Bayonne Hospital and Dispensary [3-50]	Bayonne, N. J.	A. J. Balsamo	882	4	1	3	175
Harrison S. Martland Medical Center [1-3]	Newark, N. J.	E. Swidman	390	8	1	3	162
Albany Hospital [1-3]	Albany, N. Y.	W. A. Milner	961	14	1	4	160
Jewish Hospital [2-3]	Brooklyn, N. Y.	A. Segal-P. Katzen	594	1	1	2	100
Kings County Hospital	Brooklyn, N. Y.						
Division I [1-3]	Brooklyn, N. Y.	J. J. Bottone	576	19	1	3	107
Division II [1-3]	Brooklyn, N. Y.	F. C. Hamm	659	17	1	3	105
Long Island College Hospital [1-3]	Brooklyn, N. Y.	H. C. Harlin	668	1	..	2	156
Maimonides Hospital [1-3]	Brooklyn, N. Y.	H Hermann	1,045	8	1	4	75
Methodist Hospital [1-3]	Brooklyn, N. Y.	O. P. Schoenemann	772	5	..	1	175
Veterans Admin. Hospital [2-3]	Buffalo	F. L. Senger	423	15	1	3	...
Buffalo General Hospital [1-3]	Buffalo	O. J. Oberkircher	1,007	6	1	3	175
Roswell Park Memorial Hospital [1-3]	Buffalo	W. Staubitz	268	14	..	2	...
Edward J. Meyer Memorial Hospital [1-3-248]	Buffalo	E. L. Brodie	381	9	1	5	247
Millard Fillmore Hospital [1-3]	Elmhurst, N. Y.	P. A. Greco	1,027	15	1	3	285
Elmhurst General Hospital [1-3]	Hempstead, N. Y.	W. L. F. Ferber	287	5	1	3	105
Meadowbrook Hospital [1-3]	Jamaica, N. Y.	R. M. Bowels	651	27	1	3	225
Queens Hospital Center [1-3]		E. Rubin	568	17	1	3	105
Bellevue Hospital Center	New York City						
Div. II—Cornell University [1-3]	New York City	J. Draper	415	14	1	4	105
Div. IV—New York University Post-Graduate Medical School [270]	New York City	R. Hotchkiss	1,481	10	3	7	71
Beth Israel Hospital [1-3]	New York City	H. E. Leiter	827	6	1	3	155
Bronx Municipal Hospital Center [1-3]	New York City	H. R. Newman	307	8	2	5	125
Francis Delafield Hospital [1-3]	New York City	J. K. Lattimer	424	25	2	5	105
Fr [illegible] [1-3]	New York City	J. D. Cooney	545	8	1	3	110
[illegible] [2]	Hackensack, N. J.	F. P. Twinem	140	1	..	2	107
L [illegible] [1-3-12]	New York City	F. P. Twinem	568	4	1	1	150
Morrisania City Hospital [1-3]	New York City	H. R. Kenyon	488	13	2	4	107
Mount Sinai Hospital [1-3]	New York City	G. D. Oppenheimer	1,349	8	3	5	75
New York Hospital [1-3]		V. Marshall	1,126	..	2	6	185
New York Medical College—Metropolitan Medical Center	New York City						
Metropolitan Hospital [1-3]		T. J. Kirwin	544	6	1	3	105

Numerical and other references will be found on pages 640 through 642.

28. UROLOGY—Continued

Name of Hospital	Location	Chief of Service	Inpatients Treated	Autopsies	First Year Residencies Offered *	Total Residencies * Offered *	Beginning Stipend (Month)
New York Polyclinic Medical School and Hospital [1]	New York City	A Beneventi	740	12	1	3	125
Presbyterian Hospital [1]	New York City	J K. Lattimer	1,757	20	4	8	266
Roosevelt Hospital [1]	New York City	S A. Belsler	539	9	1	3	133
St. Clare's Hospital [1-3]	New York City	G A. Fiedler	287	2	1	3	200
St. Luke's Hospital [1-3]	New York City	J. A Taylor	531	7	1	3	100
Veterans Admin. Hospital (Bronx) [1-3-232]	New York City	A L Dean	967	23	2	5	...
Veterans Admin. Hospital (Manhattan) [1-3]	New York City	A. H Ulm	422	19	2	6	...
Strong Memorial-Rochester Municipal Hospital [1-3]	Rochester, N. Y.	W W Scott	810	..	1	3	117
State University of New York Upstate							
Medical Center [1-3]	Syracuse, N. Y.	F O Harbach	1,250	29	..	3	233
Veterans Admin. Hospital [1-3]	Syracuse, N. Y.	W L. Parry	372	10	..	1	...
North Carolina Memorial Hospital [1-3]	Chapel Hill, N. C.	P L. Bunce	398	4	..	1	266
Charlotte Memorial Hospital [1]	Charlotte, N. C.	H W McKay	1,410	11	1	3	250
Duke University Affiliated Hospitals		E P Alyea	.....	..	..	..	...
Duke Hospital [1-3]	Durham, N. C		633	2	2	6	127
Veterans Admin. Hospital [1-3]	Durham, N. C.		313	5	2	3	...
North Carolina Baptist Hospital [1-3]	Winston-Salem, N. C	F K. Garvey	1,008	3	1	4	166
Akron City Hospital [1-3]	Akron, Ohio	E W Caulfield	1,012	13	1	3	250
University of Cincinnati College of Medicine Hospital Group							
Cincinnati General Hospital [1-3]	Cincinnati	T. B Wayman	631	17	2	6	125
Veterans Admin. Hospital [1-3]	Cincinnati	G. Mellinger	265	8	..	1	...
Cleveland Clinic Hospital [1-3]	Cleveland	C. C. Higgins	1,431	9	3	8	175
Cuyahoga County Hospital [1-3]	Cleveland	H R. Trattner	278	11	..	3	162
Huron Road Hospital [1-3]	Cleveland	V. C. Laughlin	685	5	1	2	210
Western Reserve University Medical School Affiliated Hospitals							
University Hospitals [1-3]	Cleveland	L. Persky	890	4	1	3	150
Veterans Admin. Hospital [1-3]	Cleveland	L. Persky	439	12	1	3	...
Ohio State University Hospitals							
University Hospital [1-3]	Columbus, Ohio	W. N. Taylor	811	14	..	5	202
Veterans Admin. Hospital [1-3]	Dayton, Ohio	E. F. Kelly	277	11	1	2	...
St. Vincent's Hospital [1-3-14]	Toledo, Ohio	E. A. Ockuly	1,109	7	1	4	325
Maumee Valley Hospital [1-3-14]	Toledo, Ohio	E. A. Ockuly	236	7	..	..	...
University of Oklahoma Medical Center		D. W. Branham	.....	...	..	..	...
University Hospital [1-3]	Oklahoma City		285	6	1	3	200
Veterans Admin. Hospital [3]	Oklahoma City		261	10	..	1	...
University of Oregon Medical School Hospitals							
University of Oregon Medical School Hospital and Clinics [1-3]	Portland, Ore.	C. V. Hodges	1,124	27	1	4	125
Veterans Admin. Hospital [1-3]	Portland, Ore.	D. P. Paull	504	12	..	1	...
Hamot Hospital [1-3]	Erie, Pa.	R. C. Lyons	655	8	1	3	250
St. Vincent's Hospital [1-3]	Erie, Pa.	E. Hess	1,041	9	1	3	200
Harrisburg Hospital [1-3]	Harrisburg, Pa.	R. E. Allyn	734	10	1	2	250
Albert Einstein Medical Center [1-3]	Philadelphia	M. Muschat	1,267	11	2	5	125
Episcopal Hospital [1-3]	Philadelphia	G. D. Shoup	409	4	..	2	150
Graduate Hospital of the University of Pennsylvania [1-3-15]	Philadelphia	H. M. Burros	257	4	1	2	100
Mercy Hospital [1-15]	Wilkes-Barre, Pa.	C. N. Burns	403	5	1	1	250
Hahnemann Medical College and Hospital [1-3]	Philadelphia	E. W. Campbell	701	8	1	3	75
Hospital of the University of Pennsylvania [1-3]	Philadelphia	B. Hughes	956	9	1	4	125
Jefferson Medical College Hospital [1-3]	Philadelphia	T. R. Fetter	1,271	7	1	4	100
Pennsylvania Hospital [1-3]	Philadelphia	L. B. Greene	555	6	2	2	20
Philadelphia General Hospital [1-3]	Philadelphia	L. McCrea	431	9	2	5	121
Temple University Hospital [1-3]	Philadelphia	K. B. Conger	764	8	1	3	...
Veterans Admin. Hospital [1-3]	Philadelphia	O. Serlin	318	11	..	2	...
Allegheny General Hospital [1]	Pittsburgh	J. L. Hamilton	679	8	1	1	200
Mercy Hospital [1-3]	Pittsburgh	C. C. Altman	573	1	1	1	235
Health Center Hospitals of the University of Pittsburgh School of Medicine [1-3]	Pittsburgh	J. J. Lee	561	9	1	4	125
Veterans Admin. Hospital [1-3]	Pittsburgh	C. A. Kuehn	702	15	1	4	...
Robert Packer Hospital [1-3]	Sayre, Pa.	W. Baurys	773	9	1	1	225
Wilkes-Barre General Hospital [1-3]	Wilkes-Barre, Pa.	W. J. Daw	786	8	1	2	225
Rhode Island Hospital [1-3]	Providence, R. I.	E. K. Landsteiner	1,209	12	1	2	125
Teaching Hospitals of the Medical College of South Carolina	Charleston, S. C.	P. W. Sanders, Jr.	772	4	1	3	137
Medical College Hospital			.....	...	..	..	...
Roper Hospital			.....	...	..	..	...
City of Memphis Hospitals [1-3-16]	Memphis, Tenn.	S. Raines	761	8	3	6	150
Baptist Memorial Hospital [1-3-16-46]	Memphis, Tenn.	R. F. Mayer	1,309	9	..	1	260
Veterans Admin. Hospital [1-3]	Memphis, Tenn.	W. H. Walker	1,031	10	..	2	...
George W. Hubbard Hospital [1-3]	Nashville, Tenn.	D. V. Bradley	.....	..	..	..	...
Vanderbilt University Hospital [1-3]	Nashville, Tenn.	A. P. Harris	273	4	1	1	50
Parkland Memorial Hospital [1-3-393]	Dallas, Texas	H. M. Spence	467	8	1	4	150
Veterans Admin. Hospital [1-3-358-393]	Dallas, Texas	P. A. Duff	573	15	1	2	...
University of Texas Medical Branch Hospitals [1-3]	Galveston, Texas	C. A. Hooks	590	6	1	3	160
Baylor University College of Medicine Affiliated Hospitals							
Jefferson Davis Hospital [1-3]	Houston, Texas	A. J. Leader	350	14	1	3	75
Methodist Hospital [1-3]	Houston, Texas	M. K. O'Heeron	106	..	..	..	220
St. Joseph's Hospital [1-3]	Houston, Texas	M. K. O'Heeron	733	3	1	1	220
St. Luke's Episcopal Hospital [1-3]	Houston, Texas	T. H. Guthrie	2,256	7	2	2	220
Texas Children's Hospital [1-3]	Houston, Texas	T. H. Guthrie	592	1	..	..	...
Veterans Admin. Hospital [1-3]	Houston, Texas	A. J. Leader	566	16	2	6	...
Hermann Hospital [1-3-359]	Houston, Texas	C. M. Crigler	1,804	8	1	4	125
University of Vermont Affiliated Hospitals							
De Goesbriand Memorial Hospital	Burlington, Vt.	P. Powell	287	91	1	3	167
Mary Fletcher Hospital [1-3]	Burlington, Vt.	P. Powell	397	7	1	4	100
University of Virginia Hospital [1-3]	Charlottesville, Va.	H. Warren	616	6	1	4	50
Memorial Hospital	Danville, Va.	R. R. Landes	876	8	1	3	...
[illegible]	Richmond, Va.	A. I. Dodson	829	8	1	3	100
[illegible]	Richmond, Va.	R. C. Bunts	1,310	15	1	4	...
King County Hospital Unit No. 1 (Harborview) [1-17]	Seattle	D. F. McDonald	416	15	1	3	125
Veterans Admin. Hospital [1-3-17]	Seattle	D. F. McDonald	266	7	1	1	...
Madison General Hospital [1-3]	Madison, Wis.	A. P. Schoenenberger	902	7	1	1	175
University Hospitals [1-3]	Madison, Wis.	J. B. Wear	610	8	2	3	100
Milwaukee County Hospital [1-3]	Milwaukee, Wis.	R. S. Irwin	1,511	17	..	2	207
Veterans Admin. Hospital [1-3]	Milwaukee (Wood), Wis.	R. S. Irwin	820	31	2	4	...
San Juan City Hospital [1-3]	San Juan, P. R.	L. A. Sanjurjo	201	..	1	2	225

Numerical and other references will be found on pages 640 through 642.

NUMERICAL AND OTHER REFERENCES.

1. Appointments available to women applicants.
2. Appointments available to women applicants only.
3. Appointments available to graduates of foreign medical schools.
4. Training at the third year level only.
5. May include one year fellowships in the Department of Cardiology.
6. May include one year of training at Cook County Hospital, Chicago, by special arrangement.
7. May include one year of surgical research at Louisiana State University School of Medicine.
8. Includes fellowships.
9. In addition to three intramural years at White Memorial Hospital, coordinated three year program: White Memorial Hospital affords two years, Presbyterian Hospital-Olmstead Memorial Hospital one year. Residents should apply to White Memorial Hospital.
10. In addition to three intramural years at Veterans Administration Hospital, coordinated three year program: Touro Infirmary affords one year, Veterans Administration Hospital final two years. Residents should apply to Veterans Administration Hospital.
11. Coordinated three year program: Peter Bent Brigham Hospital affords two years, Veterans Administration Hospital, West Roxbury, Mass., one year. Residents should apply to Peter Bent Brigham Hospital
12. In addition to three intramural years at Lincoln Hospital, coordinated three year program: Lincoln Hospital affords two years, Hackensack Hospital one year. Residents should apply to Lincoln Hospital.
13. Approved Category I. Residents interested should consult J. A. M. A., Vol. 168, No. 5, pp. 674-678, Oct. 4, 1958.
14. Coordinated three year program: St. Vincent's Hospital affords two years, Maumee Valley Hospital, one year. Residents should apply to St. Vincent's Hospital.
15. In addition to three intramural years at Graduate Hospital of the University of Pennsylvania, coordinated three year program: Graduate Hospital affords two years, final year at Mercy Hospital Residents should apply to Graduate Hospital.
16. In addition to three intramural years at City of Memphis Hospitals, cordinated three year program City of Memphis Hospitals affords two years, Baptist Memorial Hospital one year. Residents should apply to City of Memphis Hospitals.
17. In addition to three intramural years at King County Hospital, Unit No. 1 (Harborview); coordinated three year program: King County Hospital affords two years, final year at Veterans Admin. Hospital, Seattle. Residents should apply to King County Hospital.
18. *Training limited to Contagious Diseases.*
19. In addition to three years in Internal Medicine, one year of training in Hematology is available.
20. Also includes affiliating training at the Veterans Administration Hospital, Boston (Jamaica Plain), Mass.
21. Combined integrated program—Bellevue Div. II (Cornell and Memorial Cancer Center.)
22. Training in pediatric psychiatry (third year level).
23. *To include one year of affiliate training at the second year level at the University Hospitals (Lakeside) Cleveland.*
24. This one year of training is equivalent to one year of basic science as a part of an approved three year program.
25. One year of clinical investigation available.
26. An additional one year of fellowship training in cardio-pulmonary laboratory is available.
27. Includes one year of training at Veterans Administration Hospital, Iowa City.
28. Provides training at the third year level, affiliate training with University of Minnesota Hospitals, Minneapolis.
29. Approved for affiliate training only.
30. Obstetrical and Gynecological pathology only.
31. Special pathology as a part of pathologic anatomy. See Board [illegible]
32. [illegible] P. Residents interested should consult [illegible] No. 5, p. 674-678, Oct. 4, 1958.
33. LaRabida Sanitarium, Lewis Memorial Maternity Hospital, Municipal Contagious Disease Hospital, St. Joseph Hospital, St. Vincent's Hospital, Chicago.
34. Methodist Hospital and St. Francis Hospital Divisions.
35. Affiliate rotation at Yale-New Haven Medical Center, Grace-New Haven Community Hospital.
36. Six months of training is afforded at University Hospitals, Iowa City.
37. Offer training at the third year level only.
38. In addition to the three year program at Bellevue Medical Center, Division I, another program has been approved for two years of training which includes rotation on the following services:
    Columbia University Division and Medical Chest Service,
      Bellevue Hospital,
    Columbia Research Division, Goldwater Memorial Hospital,
    Medical Service, Francis Delafield Hospital.
39. Includes one year of training at Parkland Memorial Hospital, Dallas, Texas.
40. Approved for training at the first year level.
41. Previous internship not required.
43. Approved Category H. Residents interested should consult J. A. M. A., Vol. 168, No. 5, pp. 674-678, Oct. 4, 1958.
44. Approved Category J. Residents interested should consult J A. M. A., Vol. 168, No. 5, pp 674-678, Oct. 4, 1958.
45. Includes one year fellowship in the cardiopulmonary laboratory.
46. Provides one year of training at third year level as part of three-year program at City of Memphis Hospitals.
47. Includes one year of training at State University of Iowa Hospitals, Iowa City.
48. One year of approved resident training in Pulmonary Diseases is offered at each the University of Kansas Medical Center, Kansas City, Kan., and the Veterans Admin. Hospital, Kansas City, Mo.
49. In addition to three intramural years at Sinai Hospital, Baltimore, coordinated three-year program: Sinai Hospital affords first two years, Fordham Hospital one year (third yr.). Residents should apply to Sinai Hospital
50. Coordinated three-year program: Bayonne Hospital and Dispensary affords two years; Jersey City Medical Center, Jersey City, one year. Residents should apply to Bayonne Hospital and Dispensary.
51. Medical College of Alabama Hospitals, Birmingham, Ala.
52. Mount Sinai Hospital, Los Angeles.
53. Stanford University Hospitals, San Francisco.
54. Valley Children's Hospital, Fresno, Calif.
55. Harbor General Hospital, Torrance, Calif.
56. Children's Hospital, Los Angeles.
57. Seaside Memorial Hospital, Long Beach, Calif.
58. Veterans Admin. Mental Hygiene Clinic, Los Angeles.
59. Los Angeles County Hospital, Los Angeles.
60. Rancho Los Amigos, Hondo, Calif.
61. Children's Hospital, Los Angeles; Olive View Sanatorium, Olive View, Calif.
62. City of Hope Med. Center, Duarte, Calif.
63. *Metropolitan State Hospital*, Norwalk, Calif.
    Vet. Admin. Hospital, Los Angeles.
    Vet. Admin. Hospital, Sepulveda, Calif.
64. Veterans Admin. Hospital, Los Angeles
65. Huntington Memorial Hospital, Pasadena, Calif.
66. Reiss Davis Clinic for Child Guidance, Los Angeles.
67. Glendale Sanitarium & Hospital, Glendale, Calif.
68. *Children's Hospital, Hollywood* Presbyterian Hospital, Los Angeles.
69. Pacific State Hospital, Pomona, Calif.
70. Pasadena *Child Guidance Clinic, Pasadena*, Calif.
71. [illegible] County Hospital,
    [illegible] Oakland, Calif.
72. [illegible] Oakland, Calif.
73. Cowell Hospital, State Mental Hygiene Clinic, Berkeley, Calif.; Children's Hospital, Langley Porter Clinic, Mount Zion Hospital, Stanford University [illegible] Admin. Hospital, Veterans Regional Office [illegible] c, San Francisco.
74. *California Babies and* [illegible]
    California Hospital, Los Angeles.
75. Berkeley State Mental Hygiene Clinic,
    Cowell Memorial Hospital, Berkeley, Calif.
    Child Guidance Clinic, Children's Hospital.
    San Francisco City & County Hospital, San Francisco.
76. San Mateo [illegible] Hospital San Mateo, Calif.
77. Santa Clar[illegible] Jose, Calif.
78. San Franci[illegible] cisco.
79. San Franci[illegible] Pacific Hospital, San Francisco; Santa Clara County Hospital, San Jose, Calif.
80. Franklin Hospital, Veterans Admin. Hospital, San Francisco.
81. Berkeley State Mental Hygiene Clinic,
    Cowell Memori[illegible] Calif.;
    Child Guidance [illegible] tal,
    San Francisco [illegible]
82. Franklin Hospital,
    San Francisco Hospital, San Francisco;
    Mills Memorial Hospital, San Mateo, Calif.
83. Langley Porter Clinic, San Francisco.
84. San Francisco Hospital, San Francisco;
    Santa Cla[illegible] San Jose, Calif.
    [illegible] San Francisco.
85. University [illegible]
86. Stanford [illegible] Hospitals, San Francisco.
    [illegible] rancisco.
87. [illegible] Hospital, Oakland, Calif.
88. [illegible]
89. Santa Barbara General Hospital, Santa Barbara, Calif.
90. University of California Hospital, Los Angeles.
91. Colorado State Hospital, *Pueblo, Colo.*
92. University of Colorado Medical Center, Denver.
93. Children's Hospital, Denver.
    [illegible] Denver
94. Denver Ge[illegible]
95. *Colorado* [illegible]
    Denver Ge[illegible]
96. Children's Hospital, Colorado General Hospital,
    Denver General Hospital, General Rose Hospital, Denver.
97. Children's Hospital,
    St Luke's Hospital, Denver.
98. Parkview Hospital, Pueblo, Colo.
99. St. Mary-Corwin Hospital, Pueblo, Colo.
100. J. J. McCook Mem'l Hospital, Hartford, Conn.; Newington Home for Crippled Children, Veterans Admin. Hospital, Newington, Conn.; Beverly Hospital, Beverly, Mass., Holyoke Hospital, Holyoke, Mass.
101. Cedarcrest State T.B. Sanatorium, Veterans Admin. *Hospital*, Newington, Conn.
102. Cedarcrest State T B. Sanatorium, Newington, Conn.; Uncas on Thames State T.B. Sanitorium, Norwich, Conn.; Day-Kimball Hospital, Putnam, Conn.; Johnson Mem'l Hospital, Stafford Springs, Conn.
103. Veterans Admin. Hospital, Newington, Conn.
104. Veterans Admin. Hospital, Newington, Conn.; State Veterans Home and Hospital, Rocky Hill, Conn.; *Memorial Hospital*, New York City.
105. Veterans Admin. Hospital, West Haven, Conn.; Windham Community Memorial Hospital, *Willimantic*, Conn.
106. Southbury Training School, Southbury, Conn.
107. *Hart'ord Hospi*[illegible] Hartford Conn.
    [illegible] n, Conn.
108. *Veterans Admin* [illegible] Conn.
109. Laurel Heights [illegible], New Haven, Conn.
110. Grace-New Have[illegible] *Baltimore*, Md.
111. Hospital for th[illegible]
112. Childrens' Hospital, Armed Forces Institute of *Pathology*, D. C.
    General Hospital, Washington, *D. C.*

113 D C General Hospital, Veterans Admin Hospital, Washington, D C
114 Arlington Hospital, Arlington, Va
115 D C General Hospital, Washington, D C
116 Columbia Hospital, Georgetown University Hospital, George Washington University Hospital, Washington, D C; Naval Medical Center, Bethesda Md
117 Georgetown University Hospital George Washington University Hospital Walter Reed Hospital Washington, D C, Naval Medical Center, Bethesda, Md
118 Children's Hospital Georgetown University Hospital, Washington D C
119 Armed Forces Institute of Pathology, Georgetown University Hospital George Washington University Hospital Washington, D C
120 Children's Hospital Washington D C
121 Armed Forces Institute of Pathology, Children's Hospital Washington, D C
122 Emory University Hospital Grady Memorial Hospital, Atlanta Ga
123 Grady Memorial Hospital Atlanta Ga
124 Emory University Hospital Emory University, Ga
125 Chicago Wesley Memorial Hospital Chicago
126 Mercy Hospital St Anne's Hospital Chicago
127 Municipal T B Sanitarium Chicago
128 Lewis Memorial Hospital Chicago
129 Chicago State Hospital Cook County Hospital Loretto Hospital Chicago, Veterans Admin Hospital Hines, Ill
130 Veterans Admin Hospital Hines Ill
131 St Luke's Hospital Chicago
132 Cook County Hospital St Luke's Hospital Chicago
133 Cook County Hospital Chicago
134 Henrotin Hospital Chicago
135 Mercy Hospital Chicago
136 Children's Memorial Hospital Institute for Juvenile Research Passavant Hospital Chicago Wesley Memorial Hospital Veterans Admin Research Hospital Chicago
137 Presbyterian Hospital Chicago
138 Veterans Admin West Side Hospital Chicago
139 Methodist Hospital Peoria, Ill
140 Silver Cross Hospital Joliet Ill
141 Indiana University Medical Center, Indianapolis
142 Broadlawns Polk County Hospital, Des Moines Iowa
143 Blank Mem'l Hospital, Des Moines Ia
144 Boys Industrial School Kansas Treatment Center for Children Menninger Foundation Shawnee Guidance Center, Topeka State Hospital Topeka, Kan
145 Children's Mercy Hospital St Luke's Hospital Vet Admin Hospital Kansas City Mo
146 Children's Mercy Hospital St Luke's Hospital Kansas City Mo
147 Univ of Kansas Medical Center, Kansas City, Kansas Vet Admin Hospital Kansas City Mo
148 Louisville Child Guidance Clinic Louisville Ky
149 Louisville General Hospital, Louisville, Ky
150 Kentucky Baptist Hospital Louisville, Ky
151 Huey P Long Charity Hospital Pineville La
152 Lallie K Kemp Charity Hospital Independence La
F A Conway Memorial Hospital Monroe La
Huey P Long Charity Hospital Pineville, La
153 Charity Hospital (Tulane Service) Crippled Children's Hospital New Orleans
154 F A Conway Memorial Hospital Monroe La
155 Charity Hospital (Tulane Service) New Orleans
156 Charity Hospital LSU Unit New Orleans
157 Charity Hospital, Independence La
158 Touro Infirmary, New Orleans
159 Charity Hospital LSU and Tulane Units New Orleans
160 Augusta State Hospital, Augusta Maine Redington Memorial Hospital Skowhegan Maine, Thayer Hospital Waterville Maine
161 University Hospital Baltimore
162 Johns Hopkins Hospital, Baltimore
163 Hospital for the Women of Maryland, Baltimore
164 Baltimore City Hospitals, Baltimore
165 Inlow Clinic, Shelbyville, Ind
166 Johns Hopkins Hospital Kanner's Clinic Harriet Lane Home Baltimore
167 Peninsula General Hospital Salisbury Md
168 Douglas Thom Children's Clinic, James Jackson Putnam Children's Center, Massachusetts Gen'l Hospital Children's Neuropsychiatric Clinic, Veterans Admin Hospital, Veterans Admin Mental Hygiene Clinic, Boston
169 Soldiers Home, Chelsea, Mass
170 Faulkner Hospital Boston
171 Veterans Admin Hospital (Jamaica Plain) Boston
172 Lemuel Shattuck Hospital, Boston
173 Boston City Hospital, Sanatorial Divn of Boston City Hospital Boston, Vet Admin Hospital, Providence R I
174 Boston City Hospital, Boston
175 Lynn Hospital, Lynn, Mass
176 Boston State Hospital, Psychopathic Hospital, Boston, Metropolitan State Hospital, Waltham Mass, Worcester State Hospital Worcester, Mass
177 Children's Hospital, Boston, Veterans Admin Hospital West Roxbury, Mass
178 Children's Hospital, New England Deaconess Hospital Boston, Pondville Hospital, Walpole, Mass
179 Veterans Admin Hospital, West Roxbury, Mass
180 Boston City Hospital, Boston
Soldiers' Home, Chelsea, Mass
181 Evans Memorial Hospital, Haynes Memorial Hospital, Massachusetts General Hospital, Boston
182 Douglas A Thom Clinic, Harvard College Student Health Services, James Jackson Putnam Children's Center Massachusetts General Hospital, Children's Psychiatric Clinic, Veterans Admin Mental Hygiene Service, Boston
183 Lemuel Shattuck Hospital, Massachusetts General Hospital, Boston
184 Massachusetts General Hospital, Boston
185 Faulkner Hospital, Lemuel Shattuck Hospital, Boston
186 Beth Israel Hospital, Carney Hospital, St Elizabeth's Hospital, Boston, Newton Wellesley Hospital Newton Mass
187 Freedman's Hospital, Washington, D C, Carney Hospital St Elizabeth's Hospital Boston
188 Fall River General Hospital, Fall River, Mass
189 Newport Hospital, Newport, R I
190 Boston City Hospital, Boston
Brockton Hospital Brockton, Mass
191 Veterans Admin Hospital, Ann Arbor, Mich
192 Children's Hospital, Detroit Receiving Hospital, Detroit
Wayne County General Hospital, Eloise Mich
193 Detroit Receiving Hospital Detroit
194 Children's Hospital Detroit Memorial Hospital Detroit Receiving Hospital, Herman Kiefer Hospital, Women's Hospital, Detroit
195 Detroit Memorial Hospital, Detroit Receiving Hospital, Women's Hospital Detroit
196 Veterans Admin Hospital, Dearborn, Mich; Detroit Receiving Hospital Detroit
197 Oakwood Hospital, Detroit
198 Children's Hospital, Detroit
199 Children's Hospital, Herman Kiefer Hospital, Lafayette Clinic, Detroit
200 Detroit Memorial Hospital, *Detroit*
201 Veterans Admin Hospital Dearborn, Mich
202 Children's Hospital, Detroit
203 Veterans Admin Hospital, Dearborn, Mich
Children's Hospital, Detroit
204 Kalamazoo State Hospital, Kalamazoo Mich
205 *University Hospitals, Ann Arbor, Mich*
206 Veterans Admin Hospital, Minneapolis
207 Minneapolis General Hospital, Minneapolis
208 Chas T Miller Hospital Ancker Hospital, St Joseph's Hospital St Paul, Grand Forks General Hospital, Grand Forks, North Dakota
209 Anoka State Hospital, Anoka, Minn, Minneapolis General Hospital, Minneapolis
210 Minneapolis General Hospital, Veterans Admin Hospital, Minneapolis, Ancker Hospital, St Paul
211 Veterans Admin Hospital, Minneapolis
Ancker Hospital, St Paul
212 Minneapolis General Hospital, Mount Sinai Hospital, Minneapolis, Ancker Hospital, St Paul
213 Minneapolis General Hospital, Mount Sinai Hospital, Veterans Admin Hospital, Minneapolis
214 Univ of Minnesota Hospitals, Minneapolis
Ancker Hospital, St Paul
215 Univ of Minnesota Hospitals, Minneapolis
216 Chas T Miller Hospital, St Paul
217 Charity Hospital of Louisiana New Orleans
218 Mississippi State Charity Hospital, Vicksburg, Miss
219 Children's Mercy Hospital Kansas City, Mo
220 University of Kansas Medical Center, Kansas City, Kan
221 Children's Mercy Hospital, Kansas City, Mo
222 St Louis Maternity Hospital St Louis
223 Koch Hospital, Koch, Mo, Barnes Hospital Vet Admin Hospital, *St Louis*
224 St Louis Maternity Hospital St Mary's Hospital, St Louis
225 Cardinal Glennon Hospital, St Louis
226 Renard Hospital, St Louis
227 Cardinal Glennon Hospital, St Mary's Hospital, St Louis
228 Barnes Hospital, St John's Hospital, St Louis State Hospital, St Louis
229 University of Nebraska Hospitals, Omaha
230 Bishop Clarkson Hospital, Children's Memorial Hospital, Douglas County Hospital, Nebraska Methodist Hospital Omaha
231 Children's Memorial Hospital, Omaha
232 Lincoln General Hospital Lincoln, Nebr Norfolk State Hospital, Norfolk, Nebr Offutt Air Base, Omaha
233 St Joseph's Hospital Omaha
234 Nebraska Methodist Hospital, University of Nebraska Hospital Omaha
235 St Luke's Hospital New York City
236 Francis Delafield Hospital, St Vincent's Hospital New York City
237 Babies Hospital Coit Memorial, Presbyterian Hospital, St Michael's Hospital, Newark, N J
238 Bellevue Hospital Center, Memorial Hospital for Cancer and Allied Diseases, New York City
239 Hospital for Crippled Children, Newark N J, Kessler Institute for Rehabilitation, West Orange, N J
240 New Jersey State Hospital for Chest Diseases, Glen Gardner, N J
241 Bataan Methodist Memorial Hospital, Bernalillo County Indian Hospital, Albuquerque, N Mex
242 Bernalillo County Indian Hospital Albuquerque, N Mex
243 Veterans Admin Hospital, Albany, N Y
244 Brady Maternity Hospital Albany, N Y
245 Albany Hospital, Albany, N Y
246 Buffalo General Hospital, Children's Hospital, Buffalo
247 Buffalo Eye & Ear Hospital, Wettlaufer Clinic Buffalo
248 Roswell Park Memorial Hospital, Buffalo
249 Buffalo Hospital Sisters of Charity Hospital, Roswell Park Memorial Hospital, Buffalo
250 Buffalo General Hospital, Edw J Meyer Memorial Hospital, Millard Fillmore Hospital, Buffalo
251 Strong Memorial Rochester Municipal Hospitals, Rochester, N Y
252 Presbyterian Hospital, New York City
253 Queens General Hospital Jamaica, N Y
254 Triboro Hospital, Jamaica, N Y
255 Hospital for Joint Diseases, New York City
256 Utica State Hospital, Utica, N Y
257 Payne Whitney Clinic (New York Hospital), New York City
258 Montefiore Hospital, New York City
259 Memorial Center for Cancer & Allied Diseases, New York City.

260. University Hospital, Veterans *Admin.* Hospital (Manhattan), New York City.
261. Triboro Hospital, Jamaica, N. Y.; North Shore Hospital, Manhasset, N. Y.
262. Kings County Hospital, Brooklyn, N. Y.
263. *Jewish Hospital*, Maimonides Hospital, Brooklyn, N. Y.
264. Long Island College Hospital, Brooklyn, N. Y.
265. Bellevue Medical Center, New York City.
266. Henry Ford Hospital, Detroit; Children's Seashore House, Atlantic City, N. J.; Kessler Institute for Rehabilitation, West Orange, N. J.; Elmhurst General Hospital, Elmhurst, N. Y.: Beekman-Downtown Hospital, Goldwater Memorial Hospital, Hospital for Joint Diseases, Montefiore Hospital, St. Barnabas Hospital, St. Vincent's Hospital, (University Hospital,) Veterans Admin. Hospital (Manhattan), New York City; Grasslands Hospital, Valhalla, N. Y.; New York State Rehabilitation Hospital, West Haverstraw, N. Y.
267. New York Hospital, New York City.
268. Goldwater Memorial Hospital, University Hospital, Veterans Admin. Hospital (Manhattan), New York City.
269. Knickerbocker Hospital, New York City.
270. University Hospital, New York City.
271. Knickerbocker Hospital, *University Hospital, Veterans Admin.* Hospital (Manhattan), New York City.
272. Central Islip State Hospital, Central Islip, New York; University Hospital, Veterans Admin. Hospital, (Manhattan), New York City.
273. Meadowbrook Hospital, Hempstead, N. Y.; University Hospital, Veterans Admin. Hospital, (Manhattan) New York City.
274. Beekman-Downtown Hospital, Gouvernor Hospital, Manhattan State Hospital, University Hospital, New York City; Easton Hospital, Easton, Pa.
275. St. Vincent's Hospital, New York City.
276. Mount Sinai Hospital, New York City.
277. Bellevue-University Hospital (NYU), New York City.
278. Bellevue Hospital (NYU), New York City Rehabilitation Institute, West Haverstraw, N. Y.
279. Henry Ford Hospital, Detroit; Children's Seashore House, Atlantic City, N. J.; Kessler Institute for Rehabilitation, West Orange, N. J.; Elmhurst General Hospital, Elmhurst, N. Y.; Beekman-Downtown Hospital, Bellevue Medical Center, Goldwater Memorial Hospital, Hospital for Joint Diseases, Montefiore Hospital, St. Barnabas Hospital, St. Vincent's Hospital, Veterans Admin. Hospital, (Manhattan), New York City; Grasslands Hospital, Valhalla, N. Y., New York State Rehabilitation Hospital, West Haverstraw, N. Y.
280. Margaret Hague Hospital, Jersey City, N. J.
281. Bronx Municipal Hospital, St. Vincent's Hospital, New York City.
282. Veterans Admin. Hospital, Sunmount, N. Y.
283. Francis Delafield Hospital, Goldwater Memorial Hospital, New York City.
284. [illegible] Hospital, New York City.
285. [illegible] Memorial Hospital for Cancer & Allied [illegible] spital, New York City.
286. New York State Psychiatric Institute, New York City.
287. New York State Psychiatric Institute, Mount Sinai Hospital, New York City.
288. Rochester County Hospital, Rochester State Hospital, Rochester, N. Y.
289. Children's Hospital, *Buffalo.*
290. New York State Psychiatric Institute, New York City; Strong Memorial Hospital, *Rochester*, N. Y.
291. Vet. Admin. Hospital, *Batavia*, N. Y.; Highland Hospital, Rochester, N. Y.
292. Rochester State Hospital, Rochester, N. Y.
293. Genesee Hospital, *Rochester*, N. Y.
294. St. Michael's Hospital, Newark, N. J.
295. Columbia Presbyterian Medical Center, New York City.
296. Ellis H[illegible] N. Y.
297. Marga[illegible] Hospital, Jersey City, N. J.; Lenoir Count[illegible] N. C.
298. State [illegible] C.
299. North Carolina Orth[illegible] Hospital, Gastonia, N. C.
300. Warm Springs Foundation, Warm Springs, *Ga.*; *Charlotte* Memorial Hospital, Charlotte, N. C.; *Lincoln* Hospital, North Carolina Cerebral Palsy Hospital, Watts Hospital, Durham, N. C.
301. Charity Hospital, New Orleans, La.; Watts Hospital, Durham, N. C.
302. *Veterans* Admin. Hospital, Durham, N. C.
303. Veterans Admin. Hospital, Watts Hospital, Durham, N. C.; North C[illegible] N. C.
304. Western [illegible] ck Mountain, N. C.
305. City Me[illegible] N. C.
306. Graylyn [illegible] ston-Salem, N. C.
307. Children[illegible]
308. Veterans Admin. Hospital, Cincinnati.
309. Children's Hosp[illegible] pital, Cincinnati.
310. Christ Hospital, [illegible]
311. Cincinnati Gene[illegible]
312. Longview State [illegible]
313. *University Hospitals*, Veterans Admin. Hospital, Cleveland
314. Cleveland Clinic Hospital, Cleveland.
315. Cleveland City Hospital, Cleveland.
316. Veterans Admin. Hospital, Brecksville, Ohio
317. Veterans [illegible] Hospital, Brecksville, Ohio, Mount Sinai Hospital, Sun[illegible] County T B. *Hospital*, Cleveland.
318. *Univ* rsity [illegible]
319. Juvenile [illegible] olumbus Receiving Hospital for Children, Columbus, *Ohio.*
320. Children's Mental Health Center, Receiving Hospital for Children, Columbus [illegible] Columbus, Ohio.
321. Children's [illegible] Ohio.
322. Veterans A[illegible] *ton*, Ohio.
323. Florence Crittenton Home, Columbus, Ohio.
324. James Hospital, Ohio State Penitentiary, Columbus, *Ohio.*
325. Central State Hospital, Norman Okla.; Veterans Admin. Hospital, Oklahoma City.
326. Mercy Hospital, Oklahoma City.
327. Wesley Hospital, Oklahoma City.
328. Central State Hospital, *Norman, Okla.*; *Mercy Hospital*, Veterans Admin Hospital, Oklahoma City.
329. Veterans *Admin.* Hospital, *Oklahoma* City.
330. St. Anthony Hospital, Oklahoma City.
331. St. John's Hospital, Tulsa, *Okla.*
332. *University of Oklahoma Hospitals, Oklahoma* City
333. University of Oklahoma Hospitals, Wesley Hospitals, Oklahoma City.
334. Veterans *Admin. Hospital, Portland*, Ore.
335. Children's Orthopedic Hospital, Seattle.
336. Norristown State Hospital, *Norristown, Pa.*
337. Eastern Pennsylvania Psych. Institute Marriage Council of Philadelphia, St Christopher's Hospital for *Children, Temple University* Hospital, The Institute of the Pennsylvania Hospital, Univ. *of Pennsylvania Hospital* (Functional Disease Clinic), Veterans Admin. Hospital, Veterans Admin. *Hospital Mental Hygiene Clinic*, Wills Eye Hospital, Philadelphia.
338. Eastern Pennsylvania Psychiatric Institute, Philadelphia.
339. Jefferson *Hospital*, Municipal Hospital, *Philadelphia.*
340. Philadelphia General Hospital, Philadelphia.
341. *Philadelphia Psychiatric Hospital, Philadelphia.*
342. St. Christopher's Hospital for Crippled Children, Philadelphia.
343. Shriners Hospital for Crippled Children, Philadelphia
344. Graduate Hospital of the Univ. of Pennsylvania, Philadelphia.
345. Alfred I. du Pont Institute of the Nemours Foundation, Wilmington, Del.
346. Allegheny Gen'l Hospital, Pittsburgh Medical Center, Pittsburgh
347. Pittsburgh Medical Center, Pittsburgh.
348. Western Psychiatric Institute, Pittsburgh.
349. Allegheny General Hospital, Children's Hospital, Pittsburgh.
350. Children's Medical Center, Boston.
351. Boston City Hospital, Massachusetts Memorial Hospital, Boston.
352. John Gaston Hospital, *Memphis*, Tenn.
353. Lahey Clinic, Boston, John Gaston Hospital, Memphis, Tenn.
354. Nashville General Hospital, Nashville, Tenn.
355. Baylor *University* Hospital, *Children's* Medical Center, Dallas, Texas.
356. Children's Medical Center, Gaston Hospital, Parkland Memorial Hospital, Dallas, Texas.
357. Children's Medical Center, Parkland Memorial Hospital, Dallas, Texas.
358. Parkland Memorial Hospital, Dallas, Texas.
359. Univ. of Texas M. D. Anderson Hospital and Tumor Institute, Southern Pacific Hospital, Houston, Texas.
360. Univ. of Texas M. D. Anderson Hospital and Tumor Institute, Houston, Texas.
361. Baylor University Hospital, Texas Children's Hospital, Dallas, Texas.
362. Santa Rosa Hospital, San Antonio, Texas.
363. Baptist Mem'l Hospital, Santa Rosa Hospital, San Antonio, Texas.
364. Salt Lake County General Hospital, Salt Lake City.
365. Holy Cross Hospital, Salt Lake City.
366. Boston Lying-in Hospital, *Boston.*
367. Children's Medical Center, Boston.
368. Medical College of Virginia, Hospital Division, Richmond, Va.
369. Veterans *Admin. Hospital, Wood*, Wis.
370. House of Good Shepherd, Mount Sinai Hospital, Milwaukee.
371. Veterans Admin. H[illegible]
372. *Medical College of* [illegible] Richmond, Va.
373. Children's Orthoped[illegible]
374. University Hospital, [illegible]
375. Madison General Hospital, St. Mary's Hospital, Madison, Wis.
376. Veterans Admin. Hospital, Madison, Wis.
377. Milwaukee County General Hospital, Milwaukee.
378. Milwaukee Children's Hospital, Veterans Admin. Hospital, Milwaukee.
379. Milwaukee Children's Hospital, Milwaukee.
380. Milwaukee Hospital, Milwaukee.
381. Columbia Hospital, Milwaukee.
382. Milwaukee County Gen'l Hospital, Milwaukee County *Dispensary*, Milwaukee.
383. Milwaukee Child Guidance Clinic, Milwaukee County Hospital, Milwaukee Vet. Admin. Regional Office, *Mental* Hygiene Clinic, Milwaukee.
384. Milwaukee Children's Hospital, Milwaukee County General Hospital, Milwaukee.
385. *University* of Chicago Clinics, Chicago; Milwaukee Children's Hospital, Milwaukee Hospital, Milwaukee.
386. St. Francis Hospital, Honolulu, T. H.
387. Leahi Hospital, Honolulu, T. H.
388. Territorial Hospital, Kaneohe, Hawaii.
389. Queen's Hospital, Honolulu, T. H.
390. *Veterans Admin. Hospital*, 1481 W. Tenth St., Indianapolis.
391. Methodist Hospital, Indianapolis.
392. Jackson-Madison County Hospital, *Jackson*, Tenn.
393. Baylor *University Hospital*, Dallas, Texas.
394. Cook County Hospital, Veterans Admin. Research Hospital, Chicago; Veterans Ad[illegible] Hines, Ill.
395. *Stanford Universit*[illegible] sco.
396. Grace-New Haven [illegible] New Haven, Conn.; Newington Home and [illegible] Children, Newington, Conn.; Southbury [illegible] bury, Conn.
397. Jackson *Memorial* [illegible]
398. Children's Memori[illegible]
399. Children's Hospital, *Philadelphia.*
400. *Morrisania* City Hospital, New York City.
401. Duke Hospital, Durham, N. C.
402. Vanderbilt University Hospital, *Nashville*, Tenn.
403. City of *Memphis* Hospital, Memphis, Tenn.
404. *Shriners* Hospital for Crippled Children.
405. Child Guidance Clinic, Jackson, Miss.
406. Passavant *Memorial Hospital*, Veterans Administration Research Hospital, Chicago.

APPROVED RESIDENCY TRAINING PROGRAMS

Number of Institutions, 1,276, Number of Programs, 5,367

Name	Location	Approved Residencies
Birmingham Baptist Hospital ★	Birmingham, Ala	Path, Rad
Carraway Methodist Hospital ★	Birmingham, Ala.	Gen'l Pract, Int Med, Obst, Path, Surg, Urol.
Children's Hospital	Birmingham, Ala	Ped, Psych
Crippled	Birmingham, Ala	Neur, Ortho Surg
Universit	Birmingham, Ala	Anes, Derm, Int Med, Neur, Neuro Surg, Ob-Gyn., Ophth., Ortho. Surg, Otol, Path, Ped, Psych, Rad, Surg, Thor. Surg, Urol.
Veterans Admin Hospital	Birmingham, Ala	Int. Med, Neur., Ophth, Ortho Surg, Otol., Path., Psych, Rad, Surg., Urol
Lloyd Noland Hospital ★	Fairfield, Ala	Anes, Derm, *Int Med*, *Ob-Gyn*, *Ortho Surg*, Path, Ped, Surg.
U S Air Force Hospital	Maxwell Air Force Base, Ala	Gen'l Pract
Mobile County Hospital ★	Mobile Ala	Int. Med, Ortho Surg, Path, Ped, Surg
Veterans Admin Hospital	Tuskegee, Ala	Int Med, Ophth, Psych, Surg
Good Samaritan Hospital ★	Phoenix, Ariz	Gen'l Pract., Ob-Gyn, Path, Surg
Maricopa County General Hospital ★	Phoenix, Ariz	Gen'l Pract, Int Med, Ob-Gyn, Path, Ped, Pul Dis, Surg
St Joseph's Hospital ★	Phoenix, Ariz	Int Med, Ob-Gyn, Path, Ped, Surg
St Mary's Hospital and Sanatorium ★	Tucson, Ariz	Gen'l Pract, Int Med, Surg
Tucson Medical Center ★	Tucson, Ariz	Int Med, Surg
Arkansas Baptist Hospital ★	Little Rock, Ark	Ophth, Path, Surg
Arkansas Children's Hospital	Little Rock, Ark	Ortho Surg
St Vincent Infirmary ★	Little Rock, Ark	Anes
University Hospital ★	Little Rock, Ark	Anes, Gen'l Pract, Int Med, Ob-Gyn, Path, Ped., Psych., Rad, Surg, Urol
Veterans Admin Hospital	Little Rock, Ark	Int Med, Path, Surg
Veterans Admin Hospital	North Little Rock, Ark	Path, Psych
St Michael's Hospital	Texarkana Ark	Gen'l Pract
Agnews State Hospital	Agnew, Calif	Psych
General Hospital of Riverside County ★	Arlington, Calif	Gen'l Pract, Int Med, Surg
Kern County General Hospital	Bakersfield, Calif	Gen'l Pract, Int Med, Ob-Gyn, Path, Ped, Rad., Surg., Urol.
Herrick Memorial Hospital ★	Berkeley, Calif	Int Med, Ob-Gyn, Path, Psych, Surg
State of California	Berkeley, Calif	Pub Health
St Joseph Hospital	Burbank Calif	Path
Camarillo State Hospital	Camarillo, Calif	Psych
Compton Sanitarium	Compton Calif	Psych
City of Hope Medical Center	Duarte, Calif	Int Med, Path, Pul Dis, Thor Surg
U. S Army Hospital	Ford Ord, Calif	Pub Health
San Joaquin General Hospital ★	French Camp, Calif	Int Med, Ob-Gyn, Path, Ped, Rad, Surg.
General Hospital of Fresno County ★	Fresno, Calif	Int Med, Ob-Gyn, Ophth, Ped, Surg
Glendale Sanitarium and Hospital ★	Glendale, Calif	Int Med, Ob-Gyn, Path, Surg
Napa State Hospital	Imola, Calif	Psych
Scripps Clinic & Research Foundation	La Jolla, Calif	Int Med
Loma Linda Sanitarium and Hospital ★	Loma Linda Calif	Anes, Path
St Mary's Long Beach Hospital ★	Long Beach, Calif	Gen Pract, Path
Seaside Memorial Hospital ★	Long Beach Calif	Int Med, Obst, Path, Ped, Rad, Surg
Veterans Admin Hospital	Long Beach, Calif	Allergy, Card Dis, Derm, Gastro, Int Med, Neur, Neuro Surg, Ophth, Ortho Surg, Path, Psych, Rad, Surg, Urol
Barlow Sanatorium	Los Angeles	Pul Dis
California Babies' and Children's Hospital	Los Angeles	Ped
California Hospital ★	Los Angeles	Ob Gyn, Path, Surg.
Cedars of Lebanon Hospital ★	Los Angeles	Int Med, Ob-Gyn, Path, Ped, Rad, Surg
Children's Hospital ★	Los Angeles	Ortho Surg, Path, Ped
Hospital of the Good Samaritan ★	Los Angeles	Int Med, Ob-Gyn, Path, Rad, Surg
Kaiser Foundation Hospital	Los Angeles	Ob-Gyn, Urol
Los Angeles County Hospital ★	Los Angeles	Anes Derm, Int Med, Neuro Surg, Ob-Gyn, Ophth, Ortho Surg, Otol, Path, Ped, Phys Med, Psych, Pul Dis, Rad, Surg, Urol
Los Angeles Eye and Ear Hospital	Los Angeles	Ophth Otol
Mount Sinai Hospital	Los Angeles	Path, Psych
Orthopedic Hospital	Los Angeles	Ortho Surg
Presbyterian Hospital-Olmsted Memorial ★	Los Angeles	Int Med, Ob-Gyn, Surg, Urol
Queen of Angels Hospital ★	Los Angeles	Int Med, Ob-Gyn, Path, Ped, Rad, Surg
St Vincent's Hospital ★	Los Angeles	Int Med Path, Surg
Santa Fe Coast Lines Hospital ★	Los Angeles	Surg
Shriners Hospital for Crippled Children	Los Angeles	Ortho Surg
University of California Hospital ★	Los Angeles	Anes Derm, Int Med, Neur, Neuro Surg, Ob-Gyn, Ophth, Ortho Surg Otol, Path, Ped Allergy, Ped, Plas Surg, Psych, Rad, Surg, Urol
Veterans Admin Hospital ★	Los Angeles	Anes Card Dis, Derm, Gastro, Int Med, Neur, Neuro Surg, Ophth Ortho Surg, Otol, Path, Phy Med, Plas Surg, Psych, Rad, Surg., Thor Surg, Urol
White Memorial Hospital ★	Los Angeles	Anes Derm, Int Med, Neur, Neuro Surg, Ob-Gyn, Ophth, Orth Surg Otol Path, Ped, Phys Med, Proct, Rad, Surg, Urol
Contra Costa County Hospital	Martinez Calif	Gen'l Pract
Stanislaus County Hospital	Modesto Calif	Gen l Pract
Bret Harte Sanatorium	Murphys, Calif	Pul Dis
Metropolitan State Hospital	Norwalk Calif	Psych
Children's Hospital of the East Bay	Oakland Calif	Ortho Surg, Ped
Highland-Alameda County Hospital ★	Oakland Calif	Anes, Int Med, Ob-Gyn Ophth, Ortho Surg, Path, Ped, Rad, Surg, Thor Surg, Urol
Kaiser Foundation Hospital ★	Oakland, Calif	Gen l Pract Int Med Ob-Gyn, Path, Ped, Surg
Samuel Merritt Hospital	Oakland, Calif	Anes Ortho Surg, Path, Surg
U S Naval Hospital ★	Oakland Calif	Anes Gen'l Pract, Int Med, Ob-Gyn, Ophth, Ortho Surg, Otol, Path Ped, Psych, Rad, Surg, Urol
Veterans Admin Hospital	Oakland Calif	Int med, Neur, Path, Phys Med, Surg
Orange County General Hospital ★	Orange, Calif	Int Med
Veterans Admin Hospital	Palo Alto, Calif	Psych
Collis P and Howard Huntington Memorial Hosp ★	Pasadena, Calif	Int Med, Neuro Surg, Path, Plas Surg, Surg
Patton State Hospital	Patton, Calif	Psych
Pacific State Hospital	Pomona, Calif	Psych
Sequoia Hospital	Redwood City, Calif	Path
Sacramento County Hospital ★	Sacramento, Calif	Gen l Pract, Path
Sutter Community Hospital	Sacramento, Calif	Rad
Monterey County Hospital	Salinas, Calif	Gen'l Pract
San Bernardino County Charity Hospital	San Bernardino, Calif	Int Med, Path, Surg
Donald N. Sharp Memorial Hospital	San Diego, Calif.	Path
Mercy Hospital ★	San Diego, Calif	Int Med, Ob-Gyn, Path, Surg

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★ Indicates hospitals approved for training interns

Name	Location	Approved Residencies
San Diego County General Hospital ★	San Diego, Calif.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Pul. Dis., Rad., Surg., Urol.
U. S. Naval Hospital ★	San Diego, Calif.	Allergy, Anes., Card. Dis., Derm., Gen'l Pract., Int. Med., Ob.-Gyn., Ophth., Otol., Path., Ped., Rad., Surg., Thor. Surg., Urol.
Children's Hospital ★	San Francisco	Int. Med., Ob.-Gyn., Ortho. Surg., Otol., Ped., Rad.
Franklin Hospital ★	San Francisco	Int. Med., Ortho. Surg., Path., Plas. Surg., Urol.
French Hospital ★	San Francisco	Int. Med., Path., Surg.
Headquarters 6th U. S. Army	San Francisco	Pub. Health
Kaiser Foundation Hospital ★	San Francisco	Allergy, Anes., Int. Med., Ob.-Gyn., Path., Ped., Psych., Surg.
Langley Porter Neuropsychiatric Institute	San Francisco	Psych.
Letterman Army Hospital ★	San Francisco	Anes., Card. Dis., Derm., Gastro., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Mary's Help Hospital ★	San Francisco	Int. Med., Ob.-Gyn., Surg.
Mount Zion Hospital ★	San Francisco	Anes., Int. Med., Path., Ped., Psych., Rad., Surg.
St. Francis Memorial Hospital	San Francisco	Anes., Ob.-Gyn., Path., Plas. Surg., Rad.
St. Joseph's Hospital ★	San Francisco	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Surg.
St. Luke's Hospital ★	San Francisco	Int. Med., Ob.-Gyn., Path. Ped., Surg.
St. Mary's Hospital ★	San Francisco	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Psych., Rad., Surg.
San Francisco Hospital ★		
Stanford University Service	San Francisco	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Otol., Path., Ped., Pul. Dis., Rad., Surg., Urol.
University of California Service	San Francisco	Int. Med.. Ob.-Gyn., Ortho. Surg., Otol., Path., Ped., Pul. Dis., Rad., Surg., Urol.
Shriners Hospital for Crippled Children	San Francisco	Ortho. Surg.
Southern Pacific General Hospital ★	San Francisco	Int. Med., Surg., Urol.
Stanford University Hospital ★	San Francisco	Anes., Derm., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
U. S. Public Health Service Hospital ★	San Francisco	Int. Med., Ophth., Ortho. Surg., Surg.
University of California Hospital ★	San Francisco	Anes., Card. Dis., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped. Allergy, Ped., Phy. Med., Rad., Surg., Urol.
Veterans Admin. Hospital	San Francisco	Int. Med., Neur., Ophth., Ortho. Surg., Otol., Path., Rad., Surg., Urol.
O'Connor Hospital	San Jose, Calif.	Path.
Santa Clara County Hospital ★	San Jose, Calif.	Anes., Int. Med., Ob.-Gyn., Path., Ped., Pul. Dis., Rad., Surg., Urol.
Fairmont Hospital of Alameda County	San Leandro, Calif.	Pul. Dis.
Community Hospital of San Mateo County	San Mateo, Calif.	Int. Med., Ob.-Gyn., Path., Ped., Surg.
Brookside Hospital	San Pablo, Calif.	Path.
Santa Barbara Cottage Hospital ★	Santa Barbara, Calif.	Int. Med.. Path., Surg.
Santa Barbara General Hospital	Santa Barbara, Calif.	Gen'l Pract., Surg.
St. John's Hospital	Santa Monica, Calif.	Ob.-Gyn., Path., Ped., Surg.
Sonoma County Hospital	Santa Rosa, Calif.	Gen'l Pract.
Veterans Admin. Hospital	Sepulveda, Calif.	Int. Med., Psych.
Tulare-Kings Counties Joint Tuberculosis Hospital	Springville, Calif.	Pul. Dis.
Stockton State Hospital	Stockton, Calif.	Psych.
Mendocino State Hospital	Talmadge, Calif.	Psych.
Harbor General Hospital ★	Torrance, Calif.	Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Rad., Surg., Thor. Surg., Urol.
Tulare County General Hospital	Tulare, Calif.	Gen'l Pract.
Kaiser Foundation Hospital (California Rehabilitation Center)	Vallejo, Calif.	Phy. Med.
General Hospital Ventura County	Ventura, Calif.	Gen'l Pract.
Community Hospital	Boulder, Colo.	Gen'l Pract.
Glockner-Penrose Hospital ★	Colorado Springs, Colo.	Gen'l Pract., Path., Rad.
St. Francis Hospital	Colorado Springs, Colo.	Gen'l Pract.
Children's Hospital	Denver	Ortho. Surg., Path., Ped., Surg.
Fitzsimons Army Hospital ★	Denver	Anes., Card. Dis , Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Phys. Med., Pul. Dis., Rad., Surg., Thor. Surg.
General Rose Memorial Hospital ★	Denver	Path., Rad.
Mercy Hospital ★	Denver	Int. Med., Path.
National Jewish Hospital	Denver	Pul. Dis., Thor. Surg.
Porter Sanitarium and Hospital ★	Denver	Path.
Presbyterian Hospital ★	Denver	Int. Med., Ob.-Gyn., Path., Rad., Surg.
St. Anthony Hospital ★	Denver	Path.
St. Joseph's Hospital ★	Denver	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Rad., Surg.
St. Luke's Hospital ★	Denver	Int. Med., Path., Rad., Surg.
University of Colorado Medical Center		
Colorado General Hospital ★	Denver	Anes., Derm., Gen'l Pract., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped. Allergy, Ped., Phys. Med., Pul. Dis., Rad., Surg., Urol.
Colorado Psychopathic Hospital	Denver	Psych.
Denver General Hospital ★	Denver	Anes., Gen'l Pract., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped. Allergy, Ped., Pul. Dis., Rad., Surg., Urol.
Veterans Admin. Hospital	Denver	Anes., Int. Med., Neur., Neuro. Surg., Ortho. Surg., Path., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Weld County Hospital ★	Greeley, Colo.	Path.
Colorado State Hospital	Pueblo, Colo.	Int. Med., Path., Psych., Surg.
St. Mary-Corwin Hospital ★	Pueblo, Colo.	Gen'l Pract Int. Med.
Bridgeport Hospital ★	Bridgeport, Conn.	Anes., Gen'l Pract., Int. Med., Obst., Path., Rad., Surg.
St. Vincent's Hospital ★	Bridgeport, Conn.	Int. Med., Obst., Path , Rad., Surg.
Danbury Hospital ★	Danbury, Conn.	Path.
Greenwich Hospital ★	Greenwich, Conn.	Gen'l Pract., Int. Med., Path., Surg.
Hartford Hospital ★	Hartford, Conn.	Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Path., Ped., Rad., Surg.
Hartford Municipal Hospital and Health Center ★	Hartford, Conn.	Int. Med., Surg.
Institute of Living	Hartford, Conn.	Psych.
St. Francis Hospital ★	Hartford, Conn.	Anes., Int. Med., Ob.-Gyn., Path., Ped., Surg.
[illegible]	Meriden, Conn.	Path.
[illegible] pital	Middletown, Conn.	Psych.
[illegible]	Middletown, Conn.	Path.
[illegible] ospital ★	New Britain, Conn.	Int. Med., Ob.-Gyn., Path., Surg.
[illegible]	New Canaan, Conn.	Psych.
[illegible] munity Hospital ★	New Haven, Conn.	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Hospital of St. Raphael ★	New Haven, Conn.	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Rad., Surg., Thor. Surg.,
Yale University Dept. of Public Health	New Haven, Conn.	Occ. Med.
Cedarcrest Hospital	Newington, Conn.	Pul. Dis., Thor. Surg.
Newington Home and Hospital for Crippled Children	Newington, Conn.	Ortho. Surg.
Veterans Admin. Hospital	Newington, Conn.	Int. Med., Path., Surg.
Lawrence and Memorial Hospitals ★	New London, Conn.	Int. Med., Ob.-Gyn., Surg.
Fairfield State Hospital	Newtown, Conn.	Psych.
Norwalk Hospital ★	Norwalk, Conn.	Ob.-Gyn., Path., Surg.
Norwich State Hospital	Norwich, Conn.	Psych.

★ Indicates hospitals approved for training interns.

Name	Location	Approved Residencies
Norwich State Tuberculosis Sanatorium	Norwich, Conn.	Pul. Dis., Thor. Surg.
State of Connecticut Vet. Home & Hospital	Rocky Hill, Conn.	Phy. Med.
Laurel Heights Hospital	Shelton, Conn.	Pul. Dis.
Stamford Hospital ★	Stamford, Conn.	Path., Surg.
Charlotte Hungerford Hospital	Torrington, Conn.	Gen'l Pract.
St. Mary's Hospital ★	Waterbury, Conn.	Anes., Int. Med., Path., Rad., Surg.
Waterbury Hospital ★	Waterbury, Conn.	Int. Med., Path., Ped., Rad., Surg., Urol.
Veterans Admin. Hospital	West Haven, Conn.	Card. Dis., Gastro., Int. Med., Neur., Path., Psych., Pul. Dis., Rad., Surg., Urol.
State of Delaware	Dover, Del.	Pub. Health.
Delaware State Hospital	Farnhurst, Del.	Psych.
Alfred I. duPont Institute of Nemours Foundation	Wilmington, Del.	Ortho. Surg.
Delaware Hospital ★	Wilmington, Del.	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg., Urol.
Memorial Hospital ★	Wilmington, Del.	Int. Med., Path., Surg.
Wilmington General Hospital ★	Wilmington, Del.	Gen'l Pract., Int. Med., Ob.-Gyn., Path.
Armed Forces Institute of Pathology	Washington, D. C.	Path.
Army Medical Center ★ (Walter Reed Army Hospital)	Washington, D. C.	Allergy, Anes., Card. Dis., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Children's Hospital	Washington, D. C.	Neuro. Surg., Path., Ped. Allergy, Ped., Psych., Surg.
Columbia Hospital for Women and Lying-In Asylum	Washington, D. C.	Ob.-Gyn.
District of Columbia General Hospital ★	Washington, D. C.	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Phys. Med., Psych., Pul. Dis., Surg., Urol.
Doctor's Hospital ★	Washington, D. C.	Ob.-Gyn., Path., Rad., Surg.
Eastern Dispensary and Casualty Hospital	Washington, D. C.	Gen'l Pract., Surg.
Freedmen's Hospital ★	Washington, D. C.	Card. Dis., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Ped., Psych., Pul. Dis., Rad., Surg., Urol.
Georgetown University Hospital ★	Washington, D. C.	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Path., Ped., Phys. Med., Psych., Rad., Surg., Urol.
George Washington University Hospital ★	Washington, D. C.	Anes., Card. Dis., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Path., Phys. Med., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg.
Providence Hospital ★	Washington, D. C.	Anes., Int. Med., Ob.-Gyn., Path., Surg.
St. Elizabeths Hospital ★	Washington, D. C.	Psych.
Sibley Memorial Hospital ★	Washington, D. C.	Ob.-Gyn., Path., Surg.
Tuberculosis Sanatorium (Glendale, Md.)	Washington, D. C.	Pul. Dis.
Veterans Admin. Hospital	Washington, D. C.	Int. Med., Neur., Ophth., Path., Rad., Surg., Urol.
Washington Hospital Center ★	Washington, D. C.	Anes., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Rad., Surg.
Veterans Admin. Hospital	Coral Gables, Fla	Int. Med., Path., Phy. Med., Surg.
Halifax District Hospital	Daytona Beach, Fla.	Gen'l Pract.
Baptist Memorial Hospital ★	Jacksonville, Fla.	Gen'l Pract., Path.
Duval Medical Center ★	Jacksonville, Fla.	Int. Med., Ob.-Gyn., Path., Ped., Psych., Surg., Urol.
Hope Haven Hospital	Jacksonville, Fla.	Ortho. Surg.
Riverside Hospital	Jacksonville, Fla.	Int. Med., Surg.
St. Luke's Hospital ★	Jacksonville, Fla.	Gen'l Pract., Int. Med., Ob.-Gyn., Surg.
St. Vincent Hospital ★	Jacksonville, Fla.	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Surg., Urol.
State of Florida	Jacksonville, Fla.	Pub. Health
Southeast Florida Tuberculosis Hospital	Lantana, Fla.	Pul. Dis.
Jackson Memorial Hospital ★	Miami, Fla.	Anes., Card. Dis., Derm., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Variety Children's Hospital	Miami, Fla.	Ortho. Surg., Ped.
Mount Sinai Hospital of Greater Miami ★	Miami Beach, Fla.	Int. Med., Ob.-Gyn., Path., Surg.
St. Francis Hospital ★	Miami Beach, Fla.	Int. Med., Ob.-Gyn., Surg.
Orange Memorial Hospital ★	Orlando, Fla.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Surg., Urol.
Baptist Hospital	Pensacola, Fla.	Gen'l Pract., Path.
Sacred Heart Hospital ★	Pensacola, Fla.	Gen'l Pract.
U. S. Navy School of Aviation Medicine	Pensacola, Fla.	Aviat. Med.
American Legion Hospital for Crippled Children	St. Petersburg, Fla.	Ortho. Surg
Mound Park Hospital ★	St. Petersburg, Fla.	Gen'l Pract., Ob.-Gyn., Surg.
Tampa General Hospital ★	Tampa, Fla.	Int. Med., Ob.-Gyn., Ortho. Surg., Otol., Surg.
Crawford W. Long Memorial Hospital ★	Atlanta, Ga.	In. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Georgia Baptist Hospital ★	Atlanta, Ga.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Surg.
Grady Memorial Hospital ★	Atlanta, Ga.	Gen'l Pract., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Henrietta Egleston Hospital for Children	Atlanta, Ga.	Ped.
Piedmont Hospital ★	Atlanta, Ga.	Int. Med., Ob.-Gyn., Rad., Surg.
St. Joseph's Infirmary ★	Atlanta, Ga.	Card. Dis., Int. Med., Ob.-Gyn., Path., Ped., Surg., Urol.
State of Georgia	Atlanta, Ga.	Pub. Health
Veterans Admin. Hospital ★	Atlanta, Ga.	Int. Med., Ophth., Path., Rad., Surg., Urol.
Eugene Talmadge Memorial Hospital ★	Augusta, Ga.	Anes., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Ped., Psych., Rad., Surg., Thor. Surg., Urol.
University Hospital ★	Augusta, Ga.	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Psych., Rad., Surg., Urol.
Veterans Admin. Hospital	Augusta, Ga.	Int. Med., Psych., Rad., Surg.
The Medical Center ★	Columbus, Ga.	Gen'l Pract.
Scottish Rite Hospital for Crippled Children	Decatur, Ga.	Ortho. Surg.
Emory University Hospital ★	Emory University, Ga.	Anes., Card. Dis., Int. Med., Neuro. Surg., Ortho. Surg., Path., Phys. Med., Rad., Surg., Thor. Surg.
U. S. Army Hospital	Fort Benning, Ga.	Surg.
Tri-County Hospital	Fort Oglethorpe, Ga.	Gen'l Pract.
Macon Hospital ★	Macon, Ga.	Gen'l Pract., Ob.-Gyn., Surg.
Memorial Hosp. of Chatham County ★	Savannah, Ga.	Anes., Int. Med., Ob.-Gyn., Path., Surg., Urol.
Georgia Warm Springs Foundation	Warm Springs, Ga.	Phys. Med.
MacNeal Memorial Hospital ★	Berwyn, Ill.	Gen'l Pract., Surg.
Alexian Brothers Hospital	Chicago	Path.
American Hospital ★	Chicago	Path., Surg.
Augustana Hospital ★	Chicago	Int. Med., *Obst., Path., Rad.*, Surg.
Chicago Eye, Ear, Nose and Throat Hospital	Chicago	Ophth.
Chicago Maternity Center	Chicago	Obst.
Chicago State Hospital	Chicago	Psych.
Chicago State Tuberculosis Sanitarium	Chicago	Pulm. Dis., Thor. Surg.
Chicago Wesley Memorial Hospital ★	Chicago	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Psych., Rad., Surg., Urol.
Children's Memorial Hospital	Chicago	Card. Dis., Ortho. Surg., Path., Ped., Rad., Surg., Thor. Surg.
City of Chicago Dept. of Welfare Convalescent Home	Chicago	Phy. Med.
City of Chicago Municipal Tuberculosis Sanatorium	Chicago	Pul. Dis., Ther. Surg.
Columbus Hospital ★	Chicago	Int. Med., Rad.
Cook County Hospital ★	Chicago	Con. Dis., Derm., Gastro., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg , Otol., Path., Ped., Psych., Pul. Dis., Rad., Surg., Urol.
Edgewater Hospital ★	Chicago	Path.
Englewood Hospital ★	Chicago	Obst., Path., Surg.
Frank Cunneo Memorial Hospital	Chicago	Ob.-Gyn.
Grant Hospital ★	Chicago	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Surg.
Henrotin Hospital	Chicago	Surg.

★ Indicates hospitals approved for training interns.

Name	Location	Approved Residencies
Hospital of St. Anthony de Padua ★	Chicago	Obst., Surg.
Illinois Central Hospital ★	Chicago	Int. Med., Surg.
Illinois Eye and Ear Infirmary	Chicago	Ophth., Otol.
Illinois Masonic Hospital ★	Chicago	Anes., Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Lewis Memorial Maternity Hospital	Chicago	Ob.-Gyn.
Loretto Hospital ★	Chicago	Psych.
Louis A. Weiss Memorial Hospital	Chicago	Gen'l Pract.
Lutheran Deaconess Home and Hospital ★	Chicago	Obst., Surg.
Mercy Hospital ★	Chicago	Int. Med., Neuro. Surg., Ob.-Gyn., Path., Ped., Psych., Rad., Surg., Urol.
Michael Reese Hospital ★	Chicago	Allergy, Anes., Card. Dis., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped. Allergy, Ped., Psych., Pul. Dis., Rad., Surg., Urol.
Mount Sinai Hospital ★	Chicago	Anes., Card. Dis., Int. Med., Ob.-Gyn., Path., Ped., Psych., Rad., Surg., Urol.
Northwestern University Medical Center	Chicago	Allergy, Derm., Neur., Psych.
Norwegian-American Hospital ★	Chicago	Int. Med., Path., Surg.
Passavant Memorial Hospital ★	Chicago	Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Rad., Surg.
Presbyterian Hospital ★	Chicago	Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Provident Hospital ★	Chicago	Int. Med., Ob.-Gyn., Ped., Rad., Surg.
Ravenswood Hospital ★	Chicago	Path., Surg.
St. Anne's Hospital ★	Chicago	Obst., Path., Surg.
St. Elizabeth Hospital ★	Chicago	Ob.-Gyn., Ortho. Surg., Surg.
St. Joseph Hospital ★	Chicago	Int. Med., Ob.-Gyn., Path., Surg.
St. Luke's Hospital ★	Chicago	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Psych., Rad., Surg., Urol.
St. Mary of Nazareth Hospital ★	Chicago	Gen'l Pract., Int. Med., Path., Surg.
Shriners Hospital for Crippled Children	Chicago	Ortho. Surg.
South Shore Hospital ★	Chicago	Gen'l Pract.
Swedish Covenant Hospital ★	Chicago	Obst.
University of Chicago Clinics ★	Chicago	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
University of Illinois Neuropsychiatric Institute	Chicago	Neur., Neuro. Surg., Psych.
University of Illinois Research and Educational Hospital ★	Chicago	Allergy, Anes., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth. Ortho. Surg., Otol., Path., Ped., Plas. Surg., Psych., Rad., Surg., Urol.
Veterans Admin. Research Hospital	Chicago	Anes., Gastro., Int. Med., Neur., Neuro. Surg., Ophth., Ortho. Surg., Otol., Path., Phys. Med., Rad., Surg., Thor. Surg., Urol.
Veterans Admin. (West Side) Hospital	Chicago	Int. Med., Path., Psych., Rad., Surg.
Woodlawn Hospital ★	Chicago	Surg.
Decatur and Macon County Hospital ★	Decatur, Ill.	Gen'l Pract.
Veterans Admin. Hospital	Downey, Ill.	Psych.
Evanston Hospital ★	Evanston, Ill.	Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Rad., Surg.
St. Francis Hospital ★	Evanston, Ill.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Rad., Surg.
Little Company of Mary Hospital ★	Evergreen Park, Ill.	Ob.-Gyn., Ped., Rad., Surg.
Galesburg State Research Hospital	Galesburg, Ill.	Psych.
U. S. Naval Hospital ★	Great Lakes, Ill.	Int. Med., Ob.-Gyn., Surg.
Veterans Admin. Hospital	Hines, Ill.	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ophth., Ortho. Surg., Otol., Path., Plas. Surg., Psych., Rad., Surg., Thor. Surg., Urol.
Suburban Cook County Tuberculosis Hospital-Sanitarium	Hinsdale, Ill.	Thor. Surg.
St. Joseph's Hospital	Joliet, Ill.	Anes.
Community Memorial General Hospital	LaGrange, Ill.	Surg.
Mount Vernon State Tuberculosis Sanitarium	Mount Vernon, Ill.	Pul. Dis.
Cook County Tuberculosis Hospital	Oak Forest, Ill.	Pul. Dis.
West Suburban Hospital ★	Oak Park, Ill.	Ortho. Surg
Institute of Physical Medicine & Rehabilitation	Peoria, Ill.	Phys. Med.
Methodist Hospital of Central Illinois ★	Peoria, Ill.	Gen'l Pract., Path., Surg.
Peoria Municipal Tuberculosis Sanitarium	Peoria, Ill.	Pul. Dis.
St. Francis Hospital ★	Peoria, Ill.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Rad., Surg.
Rockford Memorial Hospital ★	Rockford, Ill.	Path. Rad.
St. Anthony's Hospital ★	Rockford, Ill.	Ob.-Gyn., Path., Surg.
State of Illinois	Springfield, Ill.	Pub. Health
Carle Memorial Hospital	Urbana, Ill.	Path., Rad.
North Shore Health Resort	Winnetka, Ill.	Psych.
Clinic Hospital	Bluffton, Ind.	Int. Med., Surg.
St. Josephs Hospital ★	Fort Wayne, Ind.	Path.
Methodist Hospital ★	Gary, Ind.	Gen'l Pract., Path.
Indianapolis General Hospital ★	Indianapolis	Anes., Card. Dis., Derm., Gastro., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Indiana University Medical Center ★	Indianapolis	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Psych., Rad., Surg., Urol.
LaRue D. Carter Memorial Hospital	Indianapolis	Psych.
Methodist Hospital ★	Indianapolis	Gen'l Pract., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Rad., Surg., Urol.
St. Vincent's Hospital ★	Indianapolis	Card. Dis., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Surg.
Veterans Admin. Hospital	Indianapolis	Int. Med., Neuro. Surg., Ortho. Surg., Path., Psych., Rad., Surg., Urol.
St. Elizabeth Hospital	Lafayette, Ind.	Int. Med., Ob.-Gyn., Path., Surg.
Ball Memorial Hospital ★	Muncie, Ind.	Path., Surg.
Healthwin Hospital	South Bend, Ind.	Pul. Dis.
Memorial Hospital ★	South Bend, Ind.	Path.
South Bend Medical Foundation	South Bend, Ind.	Path.
Dr. Norman M. Beatty Memorial Hospital	Westville, Ind.	Psych.
St. Luke's Methodist Hospital ★	Cedar Rapids, Iowa	Path.
Mental Health Institute	Cherokee, Iowa	Psych.
Broadlawns—Polk County Hospital ★	Des Moines, Iowa	Gen'l Pract., Surg.
Iowa Methodist Hospital ★	Des Moines, Iowa	Int. Med., Path., Ped., Rad., Surg.
Mercy Hospital ★	Des Moines, Iowa	Path.
Veterans Admin. Hospital	Des Moines, Iowa	Anes., Int. Med., Ortho. Surg., Path., Rad., Surg., Urol.
Iowa State *Psychopathic Hospital*	Iowa City	Psych.
Mercy Hospital	Iowa City	Ortho. Surg., Path., Surg.
State University of Iowa Hospitals ★	Iowa City	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Rad., Surg., Thor. Surg., Urol.
Veterans Admin. Hospital	Iowa City	Anes., Int. Med., Neur., Otol., Path., Rad., Surg.
Halstead Hospital	Halstead, Kan.	Path.
St. Margaret Hospital ★	Kansas City, Kan.	Surg.
University of Kansas Medical Center ★	Kansas City, Kan.	Anes., Card. Dis., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
C. F. Menninger Memorial Hospital	Topeka, Kan.	Psych.
State of Kansas	Topeka, Kan.	Pub. Health
Topeka State Hospital	Topeka, Kan.	Psych.
Veterans Admin. Hospital	Topeka, Kan.	Int. Med., Neur., Psych.
Veterans Admin. Hospital	Wadsworth, Kan.	Ortho. Surg., Rad., Surg.

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St Francis Hospital ★	Wichita, Kan	Anes , Gen'l Pract Int Med , Ob-Gyn , Ortho Surg , Path , Rad., Surg
Veterans Admin. Hospital	Wichita, Kan	Surg
Wesley Hospital ★	Wichita, Kan	Gen'l Pract , Int Med , Ob -Gyn , Path , Surg
Wichita—St. Joseph Hospital ★	Wichita, Kan	Path
St Elizabeth Hospital ★	Covington, Ky	Path
William Booth Memorial Hospital	Covington, Ky	Gen'l Pract
U S Army Hospital	Fort Campbell, Ky	Surg
U S Army Hospital	Fort Knox, Ky	Gen'l Pract
Harlan Memorial Hospital	Harlan, Ky	Int Med , Surg
Central State Hospital	Lakeland, Ky	Psych
Good Samaritan Hospital ★	Lexington, Ky	Int Med Ortho Surg , Surg , Urol
St Joseph Hospital ★	Lexington, Ky	Int Med , Ob -Gyn , Ortho Surg , Surg , Urol
Shriners Hospital for Crippled Children	Lexington, Ky	Ortho Surg
U S Public Health Service Hospital	Lexington, Ky	Psych
Veterans Admin Hospital	Lexington, Ky	Psych
Children's Hospital	Louisville Ky	Anes , Neuro Surg , Path , Ped Surg
Kosair Crippled Children's Hospital	Louisville, Ky	Ortho Surg
Louisville General Hospital ★	Louisville, Ky	Anes Int Med , Neur , Neuro Surg , Ob -Gyn , Ophth , Ortho Surg , Otol , Path , Ped , Phy Med , Psych , Rad , Surg , Urol
Norton Memorial Infirmary	Louisville, Ky	Neuro Surg , Psych
St Anthony's Hospital ★	Louisville, Ky	Gen'l Pract.
St Joseph's Infirmary ★	Louisville, Ky	Int Med , Ob -Gyn , Ped , Rad , Surg
Veterans Admin. Hospital	Louisville, Ky	Int Med , Neur , Neuro Surg , Ophth , Ortho Surg , Otol , Path , Psych , Rad , Surg , Urol
Waverly Hills Sanatorium	Waverly Hills, Ky	Anes , Surg
Lafayette Charity Hospital	Lafayette, La	Gen'l Pract , Surg
St Patrick's Hospital	Lake Charles, La	Gen'l Pract
F A Conway Memorial Hospital	Monroe La	Gen'l Pract
Charity Hospital of Louisiana ★	New Orleans	Anes , Derm , Int Med , Neur , Neuro Surg , Ob -Gyn , Ophth , Ortho Surg , Otol , Path , Ped , Psych , Pul Dis , Rad , Surg , Thor Surg , Urol
Eye, Ear, Nose and Throat Hospital	New Orleans	Ophth , Otol
Hotel Dieu ★	New Orleans	Ob -Gyn , Path , Ped , Rad , Surg
Ochsner Foundation Hospital ★	New Orleans	Anes , Gastro , Int Med , Neuro Surg , Ob -Gyn , Ortho Surg , Path , Proct , Rad , Surg , Urol
Southern Baptist Hospital ★	New Orleans	Int Med , Ob -Gyn , Path , Ped , Rad , Surg
Touro Infirmary ★	New Orleans	Gastro , Gen'l Pract , Int Med , Ob -Gyn , Ortho Surg., Path , Rad , Surg , Urol
U S Public Health Service Hospital ★	New Orleans	Int Med , Ophth , Path , Rad , Surg
Veterans Admin Hospital	New Orleans	Int Med , Ophth , Ortho Surg , Path , Psych , Rad , Surg , Urol.
Huey P Long Charity Hospital	Pineville, La	Gen'l Pract
Confederate Memorial Hospital ★	Shreveport, La	Int Med , Ob -Gyn , Ortho Surg , Path , Ped , Rad , Surg , Thor Surg , Urol
Shriners Hospital for Crippled Children	Shreveport, La	Ortho Surg
Eastern Maine General Hospital ★	Bangor Maine	Anes , Path , Rad
General Maine Sanatorium	Fairfield Maine	Pul Dis
Central Maine General Hospital ★	Lewiston, Maine	Anes , Int Med , Path , Ped , Rad , Surg
Maine Medical Center ★	Portland, Maine	Anes , Card Dis , Gen'l Pract , Int Med , Path , Rad , Surg
Baltimore City Hospitals ★	Baltimore	Anes , Int Med , Neur , Ob -Gyn , Ortho Surg , Path , Ped , Rad , Surg.
Baltimore Eye, Ear and Throat Charity Hospital	Baltimore	Opthth , Otol
Bon Secours Hospital ★	Baltimore	Gen'l Pract , Ob -Gyn , Surg
Children's Hospital	Baltimore	Ortho, Surg
Church Home and Hospital ★	Baltimore	Int Med , Obst , Surg
Doctors Hospital	Baltimore	Gen'l Pract
Franklin Square Hospital ★	Baltimore	Int Med , Ob -Gyn , Path , Surg
Hospital for Women ★	Baltimore	Ob -Gyn
James Lawrence Kernan Hospital for Crippled Children	Baltimore	Ortho Surg
Johns Hopkins Hospital ★	*Baltimore*	Derm , Int Med , Neur , Neuro Surg , Ob-Gyn , Ophth , Ortho Surg , Otol , Path , Ped , Plas Surg , Psych , Rad., Surg , Urol.
Lutheran Hospital ★	Baltimore	Int Med , Ob -Gyn , Path , Surg
Maryland General Hospital ★	Baltimore	Int Med , Ob -Gyn , Path , Surg
Mercy Hospital ★	Baltimore	Int Med , Ob-Gyn , Otol , Path , Ped , Surg
Provident Hospital and Free Dispensary ★	Baltimore	Path , Surg
St Agnes Hospital ★	Baltimore	Ob -Gyn , Surg
St Joseph's Hospital ★	Baltimore	Int Med , Ob -Gyn , Surg
Seton Institute	Baltimore	Psych
Sinai Hospital ★	Baltimore	Int Med , Ob -Gyn , Path , Ped , Rad , Surg , Urol.
South Balti[illegible]	Baltimore	Int Med , Obst , Otol , Surg
[illegible]	Baltimore	Pub Health
[illegible]	Baltimore	Int Med , Ob -Gyn., Path , Ped , Surg
[illegible]	Baltimore	Int Med , Ophth , Path , Rad , Surg
[illegible]	Baltimore	Anes , Derm Gen'l Pract , Int Med , Neur , Neuro. Surg., Ob -Gyn , Ortho Surg , Otol , Path , Ped , Psych , Rad , Surg., Thor. Surg., Urol.
Veterans Admin Hospital	Baltimore	Pul Dis
National Institutes of Health—Clinical Center	Bethesda, Md	Int Med , Neuro , Path , Psych , Rad
Suburban Hospital ★	Bethesda, Md	Gen'l Pract , Path
U. S Naval Hospital ★	Bethesda, Md	Anes , Card Dis , Int Med , Neur , Ob -Gyn., Ophth., Ortho Surg , Otol , Path , Ped , Psych , Rad , Surg., Urol.
Spring Grove State Hospital	Catonsville, Md	Psych
Prince George's General Hospital ★	Cheverly, Md	Int Med , Ob -Gyn., Path., Surg
Crownsville State Hospital	Crownsville, Md	Psych
Veterans Admin. Hospital	Fort Howard, Md	Derm , Int Med , Ophth , Surg , Urol.
Washington County Hospital ★	Hagerstown, Md	Rad
Veterans Admin Hospital	Perry Point, Md	Int Med , Psych , Surg
Chestnut Lodge Sanitarium	Rockville, Md	Psych
Springfield State Hospital	Sykesville, Md	Psych.
Sheppard and Enoch Pratt Hospital	Towson, Md	Psych
Veterans Admin Hospital	Bedford, Mass	Psych
McLean Hospital	Belmont, Mass	Psych
Beverly Hospital ★	Beverly, Mass	Path , Surg
Beth Israel Hospital ★	Boston	Card Dis , Gastro , Int Med., Obst , Otol , Path , Psych , Rad , Surg , Urol
Boston City Hospital ★	Boston	Anes , Derm , Int Med , Neur , Neuro. Surg , Ob -Gyn , Ophth , Ortho. Surg , Otol , Path , Ped , Rad , Surg., Thor. Surg , Urol
Boston Floating Hospital ★	Boston	Ped
Boston Lying-In Hospital	Boston	Ob -Gyn , Path
Boston Sanatorium	Boston	Pul. Dis , Thor Surg
Boston State Hospital	Boston	Psych
Carney Hospital ★	Boston	Int Med , Ob.-Gyn., Path , Surg
Children's Medical Center ★	Boston	Neuro Surg , Ortho. Surg , Path , Ped Allergy, Ped , Surg
Faulkner Hospital	*Boston*	*Int. Med , Path , Rad*
Lahey Clinic	Boston	Anes , Gastro., Int Med , Ortho. Surg , Rad.
Lemuel Shattuck Hospital	Boston	Int Med , Path , Rad
Massachusetts Eye and Ear Infirmary	Boston	Ophth , Otol.

★ Indicates hospitals approved for training interns

Name	Location	Approved Residencies
Massachusetts General Hospital ★	Boston	Allergy, Anes., Derm., Int. Med., Neur., Neuro. Surg., Ortho. Surg., Path., Ped., Phys. Med., Psych., Rad., Surg., Urol.
Massachusetts Memorial Hospital ★	Boston	Anes., Con. Dis., Derm., Gastro., Int. Med., Neur., Ob.-Gyn., Ophth., Otol., Path., Psych., Rad., Surg., Urol.
Massachusetts Mental Health Center	Boston	Psych.
New England Center Hospital ★	Boston	Anes., Gyn., Int. Med., Neur., Neuro. Surg., Path., Psych., Rad., Surg., Urol.
New England Deaconess Hospital	Boston	Anes., Int. Med., Path., Rad., Thor. Surg.
New England Hospital ★	Boston	Anes., Gen'l Pract., Obst., Surg.
Peter Bent Brigham Hospital ★	Boston	Anes., Card. Dis., Int. Med., Neuro. Surg., Ortho. Surg., Path., Psych., Rad., Surg., Urol.
St. Elizabeth Hospital ★	Boston	Anes., Int. Med., Ob.-Gyn., Path., Psych., Surg.
St. Margaret's Hospital	Boston	Ob.-Gyn.
U. S. Public Health Service Hospital ★	Boston	Int. Med., Surg.
Veterans Admin. Hospital	Boston (Jamaica Plain)	Anes., Int. Med., Neur., Neuro. Surg., Ortho. Surg., Otol., Path., Phys. Med., Psych., Rad., Surg., Urol.
Veterans Admin. Hospital	Boston (West Roxbury)	Card. Dis., Path., Rad., Urol.
Brockton Hospital ★	Brockton, Mass.	Surg.
Veterans Admin. Hospital	Brockton, Mass.	Psych.
Booth Memorial Hospital and Home	Brookline, Mass.	Obst.
Free Hospital for Women	Brookline, Mass.	Ob.-Gyn., Path.
Cambridge City Hospital ★	Cambridge, Mass.	Anes., Int. Med., Ob.-Gyn., Path., Rad., Surg.
Cambridge Sanitarium	Cambridge, Mass.	Pul. Dis.
Mount Auburn Hospital ★	Cambridge, Mass.	Anes., Int. Med., Path., Rad., Surg.
Massachusetts Hospital School	Canton, Mass.	Ortho. Surg.
Lawrence F. Quigley Memorial Hospital	Chelsea, Mass.	Int. Med., Surg.
U. S. Naval Hospital ★	Chelsea, Mass.	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Ped., Rad., Surg.
Fall River General Hospital	Fall River, Mass.	Surg.
St. Anne's Hospital	Fall River, Mass.	Gen'l Pract., Ob.-Gyn.
Truesdale Hospital ★	Fall River, Mass.	Path., Surg.
Burbank Hospital	Fitchburg, Mass.	Path., Surg.
Foxboro State Hospital	Foxboro, Mass.	Psych.
Holyoke Hospital ★	Holyoke, Mass.	Anes., Path.
Lawrence General Hospital ★	Lawrence, Mass.	Path.
Lowell General Hospital ★	Lowell, Mass.	Path.
Lynn Hospital ★	Lynn, Mass.	Path.
Malden Hospital	Malden, Mass.	Int. Med., Path., Surg.
Medfield State Hospital	Medfield, Mass.	Psych.
Lakeville State Sanatorium	Middleboro, Mass.	Ortho Surg.
St. Luke's Hospital ★	New Bedford, Mass.	Path.
Newton-Wellesley Hospital ★	Newton, Mass.	Int. Med., Path., Surg.
Pittsfield General Hospital	Pittsfield, Mass.	Path.
Quincy City Hospital ★	Quincy, Mass.	Int. Med., Ob.-Gyn., Path., Surg.
Veterans Admin. Hospital	Rutland Heights, Mass.	Pul. Dis.
Salem Hospital ★	Salem, Mass.	Int. Med., Path., Surg.
Shriners Hospital for Crippled Children	Springfield, Mass.	Ortho. Surg.
Springfield Hospital ★	Springfield, Mass.	Anes., Path., Surg.
Austen Riggs Center	Stockbridge, Mass.	Psych.
Taunton State Hospital	Taunton, Mass.	Psych.
Pondville Hospital	Walpole, Mass.	Int. Med., Path., Surg.
Metropolitan State Hospital	Waltham, Mass.	Psych.
Middlesex County Sanatorium	Waltham, Mass.	Pul. Dis
Westboro State Hospital	Westboro, Mass.	Psych.
Westfield State Sanatorium	Westfield, Mass.	Pul. Dis., Surg.
Memorial Hospital ★	Worcester, Mass.	Int. Med., Path., Surg
St. Vincent's Hospital ★	Worcester, Mass.	Anes., Int. Med., Path., Ped., Surg.
Worcester City Hospital ★	Worcester, Mass.	Gen'l Pract., Int. Med., Ortho. Surg., Path., Ped., Surg.
Worcester County Sanatorium	Worcester, Mass.	Pul. Dis.
Worcester State Hospital	Worcester, Mass.	Psych.
St. Joseph Mercy Hospital ★	Ann Arbor, Mich.	Int. Med., Ob.-Gyn., Plas. Surg., Rad., Surg.
University Hospital ★	Ann Arbor, Mich.	Allergy, Anes., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Leila Y. Post Montgomery Hospital ★	Battle Creek, Mich.	Path., Rad., Surg.
Oakwood Hospital ★	Dearborn, Mich.	Gen'l Pract., Ob.-Gyn., Path.
Veterans Admin. Hospital	Dearborn, Mich.	Int. Med., Ophth., Path., Rad., Surg.
Alexander Blain Hospital	Detroit	Int. Med., Surg.
Brent General Hospital	Detroit	Gen'l Pract.
Children's Hospital	Detroit	Ortho. Surg., Path., Ped.
Crittenton General Hospital	Detroit	Ob.-Gyn.
Detroit Memorial Hospital ★	Detroit	Int. Med., Ob.-Gyn., Path., Rad., Surg.
Evangelical Deaconess Hospital ★	Detroit	Gen'l Pract., Int. Med., Ob.-Gyn., Surg.
Grace Hospital ★	Detroit	Int. Med., Neuro. Surg., Ob.-Gyn., Path., Rad., Surg., Urol.
Harper Hospital ★	Detroit	Anes., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Rad., Surg., Urol.
Henry Ford Hospital ★	Detroit	Anes., Card. Dis., Derm., Gastro., Gen'l Pract., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Herman Kiefer Hospital	Detroit	Con. Dis., Ob.-Gyn., Path., Pul. Dis., Rad., Thor. Surg.
Jennings Memorial Hospital	Detroit	Int. Med., Surg.
Lafayette Clinic	Detroit	Neur., Psych.
Lynn Hospital	Detroit	Gen'l Pract.
Mount Carmel Mercy Hospital ★	Detroit	Int. Med., Ob.-Gyn., Path., Rad., Surg.
North Detroit General Hospital	Detroit	Gen'l Pract.
Providence Hospital ★	Detroit	Anes., Int. Med., Ob.-Gyn., Path., Rad., Surg.
Receiving Hospital ★	Detroit	Anes., Derm., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Psych., Rad., Surg., Urol.
St. John Hospital ★	Detroit	Int. Med., Ob.-Gyn., Surg.
St. Joseph Mercy Hospital ★	Detroit	Int. Med., Ob.-Gyn., Surg.
Sinai Hospital ★	Detroit	Anes., Int. Med., Ob.-Gyn., Path., Rad., Surg.
Woman's Hospital ★	Detroit	Int. Med , Ob.-Gyn., Path., Surg.
Wayne County General Hospital and Infirmary ★	Eloise, Mich.	Int. Med., Path., Psych., Rad., Surg., Urol.
Hurley Hospital ★	Flint, Mich.	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
McLaren General Hospital ★	Flint, Mich.	Gen'l Pract., Int. Med., Path., Surg.
St. Joseph Hospital ★	Flint, Mich.	Gen'l Pract., Path., Rad.
Blodgett Memorial Hospital ★	Grand Rapids, Mich.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Rad., Surg.
Butterworth Hospital ★	Grand Rapids, Mich.	Anes., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Ferguson-Droste-Ferguson Hospital	Grand Rapids, Mich.	Proct.
St. Mary's Hospital ★	Grand Rapids, Mich.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Surg.
Bon Secours Hospital ★	Grosse Pointe, Mich.	Int. Med., Surg.
Highland Park General Hospital ★	Highland Park, Mich.	Int. Med., Ob.-Gyn., Surg.
Michigan State Sanatorium	Howell, Mich.	Pul. Dis.
W. A. Foote Memorial Hospital	Jackson, Mich.	Path.
Borgess Hospital ★	Kalamazoo, Mich.	Gen'l Pract., Ob.-Gyn., Ortho. Surg., Path., Surg.

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Bronson Methodist Hospital ★	Kalamazoo, Mich	Int. Med, Surg
Edward W Sparrow Hospital ★	Lansing, Mich	Int Med, Path, Surg
Ingham Chest Hospital	Lansing, Mich	Thor Surg
St Lawrence Hospital ★	Lansing, Mich	Int Med
State of Michigan	Lansing, Mich	Pub Health
Hawthorn Center	Northville, Mich	Psych
Northville State Hospital	Northville, Mich	Psych
William H Maybury Sanatorium	Northville, Mich	Pul Dis
Pontiac General Hospital ★	Pontiac, Mich	Int Med, Ob-Gyn, Path, Surg
Pontiac State Hospital	Pontiac, Mich	Psych
St Joseph Mercy Hospital ★	Pontiac, Mich	Gen'l Pract, Int. Med, Ob-Gyn., Path, Ped, Rad, Surg.
William Beaumont Hospital ★	Royal Oak, Mich	Int Med, Ob-Gyn, Surg
Saginaw General Hospital ★	Saginaw, Mich	Int Med, Ob-Gyn, Path, Ped, Surg
St Mary's Hospital ★	Saginaw, Mich	Gen'l Pract
James Decker Munson Hospital ★	Traverse City, Mich	Gen'l Pract
Traverse City State Hospital	Traverse City, Mich	Psych
Wyandotte General Hospital	Wyandotte, Mich	Gen'l Pract
Ypsilanti State Hospital	Ypsilanti, Mich	Psych
St. Luke's Hospital ★	Duluth, Minn	Path
St Mary's Hospital ★	Duluth, Minn	Path
Asbury Methodist Hospital ★	Minneapolis	Int Med
Fairview Hospital	Minneapolis	Gen'l Pract
Lutheran Deaconess Home and Hospital	Minneapolis	Gen'l Pract
Minneapolis General Hospital ★	Minneapolis	Derm, Int Med, Ob-Gyn, Ophth, Ortho Surg, Otol, Path, Ped, Psych, Surg, Urol
Mount Sinai Hospital ★	Minneapolis	Int Med, Surg
Northwestern Hospital ★	Minneapolis	Int Med, Ob-Gyn, Path, Ped, Surg
St Barnabas Hospital ★	Minneapolis	Int Med, Ob-Gyn, Path, Surg
St Mary's Hospital ★	Minneapolis	Ob-Gyn, Urol
Shriners Hospital for Crippled Children	Minneapolis	Ortho Surg
State of Minnesota	Minneapolis	Pub Health
Swedish Hospital ★	Minneapolis	Ob-Gyn, Path, Rad, Surg
University of Minnesota Hospitals ★	Minneapolis	Anes, Derm, Int Med, Neur, Neuro Surg, Ob-Gyn., Ophth, Ortho Surg, Otol, Path, Ped, Phys Med, Proct, Psych, Rad, Surg, Urol
Veterans Admin Hospital	Minneapolis	Derm, Int Med, Neur, Neuro Surg, Ophth, Ortho Surg, Otol., Path, Phys Med, Psych, Pul Dis, Rad, Surg, Thor Surg, Urol
Nopeming Sanatorium	Nopeming, Minn	Pul Dis
Glen Lake Sanatorium	Oak Terrace, Minn	Pul Dis
Mayo Foundation	Rochester, Minn	Allergy, Anes, Card Dis, Derm, Gastro, Int Med, Neur., Neuro Surg, Ob-Gyn, Ophth, Ortho Surg, Otol, Path, Ped Allergy, Ped., Phys Med, Plas Surg, Proct, Psych, Pul. Dis, Rad, Surg, Thor Surg, Urol
Ancker Hospital ★	St Paul, Minn	Derm, Int Med, Ob-Gyn, Ophth, Otol, Path, Surg, Urol
Charles T Miller Hospital ★	St Paul, Minn	Int Med, Ob-Gyn, Ophth, Path, Rad, Surg, Urol
Gillette State Hospital for Crippled Children	St Paul, Minn	Ortho Surg
Midway Hospital	St Paul, Minn	Gen'l Pract
St Joseph's Hospital ★	St Paul, Minn	Ob-Gyn, Path Surg
St Luke's Hospital ★	St Paul, Minn	Gen'l Pract
Veterans Admin Hospital	Biloxi, Miss	Psych
Mississippi Baptist Hospital ★	Jackson, Miss	Gen'l Pract, Ortho Surg, Path
State of Mississippi	Jackson, Miss	Pub Health
University Hospital ★	Jackson, Miss	Gen'l Pract, Int Med, Neuro Surg, Ob-Gyn, Ophth., Orth Surg, Path, Ped, Plas Surg, Psych, Rad, Surg, Thor Surg, Urol
Veterans Admin Hospital	Jackson, Miss	Neuro Surg, Ophth, Ortho Surg, Plas Surg, Surg, Urol
Mississippi State Tuberculosis Sanatorium	Sanatorium, Miss	Pul Dis, Thor Surg
Mercy Hospital-Street Memorial	Vicksburg, Miss	Gen'l Pract, Surg
Vicksburg Hospital	Vicksburg, Miss	Surg
Mississippi State Hospital	Whitfield, Miss	Psych
St Louis County Hospital ★	Clayton, Mo	Int Med, Ob-Gyn, Path, Surg
Ellis Fischel Cancer Hospital	Columbia, Mo	Surg
University Hospitals ★	Columbia, Mo	Anes, Gen'l Pract, Int Med, Ob-Gyn, Path., Ped, Rad, Surg.
Children's Mercy Hospital ★	Kansas City, Mo	Ortho Surg, Ped
Kansas City General Hospital No 1 ★	Kansas City, Mo	Int Med, Ob-Gyn, Ophth, Ortho Surg, Otol, Path, Ped, Plas Surg., Psych, Surg, Urol
Kansas City General Hospital No 2 ★	Kansas City, Mo	Ob-Gyn, Rad, Surg.
Menorah Hospital Medical Center ★	Kansas City, Mo	Gen'l Pract, Int Med, Path, Rad, Surg
Research Hospital ★	Kansas City, Mo	Path, Rad
St Joseph Hospital ★	Kansas City, Mo	Int Med, Ob-Gyn, Path, Rad
St Luke's Hospital ★	Kansas City, Mo	Int Med, Ob-Gyn, Ortho Surg, Path, Rad, Surg
St Mary's Hospital ★	Kansas City, Mo	Path, Surg
Veterans Admin Hospital	Kansas City, Mo	Anes Int Med, Neur, Ortho Surg, Otol, Path, Phys Med, Psych, Pul Dis, Rad, Surg, Urol
Robert Koch Hospital	Koch, Mo	Pul Dis
Missouri State Sanatorium	Mount Vernon, Mo	Pul Dis, Thor Surg
Missouri Methodist Hospital ★	St Joseph, Mo	Gen'l Pract, Surg
Barnes Hospital ★	St Louis	Allergy, Anes, Derm, Int Med, Neur, Neuro Surg, Ob-Gyn, Ophth, Ortho Surg, Otol, Path, Plas Surg, Psych, Rad, Surg., Thor. Surg, Urol
De Paul Hospital ★	St Louis	Gen'l Pract, Int Med, Ob-Gyn, Path, Surg
Homer G Phillips Hospital ★	St Louis	Int. Med, Ob-Gyn, Ophth, Otol, Path, Ped, Psych, Rad, Surg, Urol.
Jewish Hospital ★	St Louis	Int Med, Ob-Gyn, Path, Rad, Surg
Lutheran Hospital ★	St Louis	Gen'l Pract
Missouri Baptist Hospital ★	St Louis	Int Med, Ob-Gyn, Path, Surg
Missouri Pacific Hospital	St Louis	Int Med, Surg, Urol
St Anthony's Hospital ★	St Louis	Gen'l Pract, Surg
St John's Hospital ★	St Louis	Anes, Int Med, Obst Path, Surg
St Louis Children's Hospital ★	St Louis	Ped
St Louis City Hospital ★	St Louis	Int Med, Neur, Ob-Gyn, Ophth, Ortho Surg, Otol., Path, Ped., Psych, Rad, Surg., Urol
St Louis State Hospital	St. Louis	Psych
St Luke's Hospital ★	St Louis	Int Med, Ob-Gyn, Path, Surg
St Mary's Group of Hospitals ★	St Louis	Int Med, Ob-Gyn, Ophth, Ortho Surg, Otol, Path, Ped., Plas. Surg, Psych Pul Dis, Rad, Surg, Urol.
Shriners Hospital for Crippled Children	St Louis	Ortho Surg
Veterans Admin Hospital	St. Louis	Anes, Int Med, Ophth, Ortho Surg, Path., Psych., Rad., Surg., Urol.
St John's Hospital	Springfield, Mo	Anes
Montana Deaconess Hospital ★	Great Falls, Mont	Int Med, Path
Hastings State Hospital	Ingleside, Neb	Psych
Lincoln General Hospital ★	Lincoln, Neb	Ob-Gyn, Path
Nebraska Orthopedic Hospital	Lincoln, Neb	Ortho Surg
St Elizabeth's Hospital ★	Lincoln, Neb	Ob-Gyn., Surg
Veterans Admin. Hospital	Lincoln, Neb	Int Med, Ortho Surg., Surg.
Bishop Clarkson Memorial Hospital ★	Omaha	Path
Children's Memorial Hospital	Omaha	Ped

★ Indicates hospitals approved for training interns

Name	Location	Approved Residencies
Creighton Memorial-St. Joseph Hospital ★	Omaha	Int. Med., Ob.-Gyn., Path., Ped., Psych., Rad., Surg.
Immanuel Hospital ★	Omaha	Gen'l Pract., Ob.-Gyn.
Nebraska Methodist Hospital ★	Omaha	Path., Rad.
University of Nebraska Hospital ★	Omaha	Anes., Card. Dis., Int. Med., Ob-Gyn., Ophth., Path., Ped., Psych., Rad., Surg.
Veterans Admin. Hospital	Omaha	Int. Med., Neur., Path., Psych., Rad., Surg.
New Hampshire State Hospital	Concord, N. H.	Psych.
Mary Hitchcock Memorial Hospital ★	Hanover, N. H.	Anes., Derm., Int. Med., Neuro. Surg., Ortho. Surg., Path., Ped., Phys. Med., Rad., Surg., Urol.
Atlantic City Hospital ★	Atlantic City, N. J.	Int. Med., Path., Surg.
Bayonne Hospital and Dispensary ★	Bayonne, N. J.	Urol.
Cooper Hospital ★	Camden, N. J.	Int. Med., Ob.-Gyn., Path., Ped., Plas. Surg., Surg.
Our Lady of Lourdes Hospital ★	Camden, N. J.	Path., Rad.
West Jersey Hospital ★	Camden, N. J.	Path., Surg.
Essex County Overbrook Hospital	Cedar Grove, N. J.	Psych.
Veterans Admin. Hospital	East Orange, N. J.	Int. Med., Neur., Path., Phys. Med., Pul. Dis., Rad., Surg., Urol.
Englewood Hospital ★	Englewood, N. J.	Path.
Hunterdon Medical Center	Flemington, N. J.	Gen'l Pract., Path.
U. S. Army Fort Dix Health Center	Fort Dix, N. J.	Pub. Health
New Jersey Sanatorium for Chest Diseases	Glen Garden, N. J.	Pul. Dis.
New Jersey State Hospital	Greystone Park, N. J.	Psych.
Hackensack Hospital ★	Hackensack, N. J.	Anes., Int. Med., Obst., Path., Rad., Surg., Urol.
New Jersey State Hospital at Ancora	Hammonton, N. J.	Psych.
St. Mary's Hospital ★	Hoboken, N. J.	Path.
Berthold S. Pollack Hospital for Chest Diseases	Jersey City, N. J.	Pul. Dis., Thor. Surg.
Christ Hospital ★	Jersey City, N. J.	Path.
Margaret Hague Maternity Hospital	Jersey City, N. J.	Obst.
Medical Center-Jersey City Hospital ★	Jersey City, N. J.	Anes., Int. Med., Gyn., Ophth., Path., Ped., Rad., Surg., Urol.
Monmouth Memorial Hospital ★	Long Branch, N. J.	Obst., Ortho., Surg., Path., Surg.
Veterans Admin. Hospital	Lyons, N. J.	Psych.
New Jersey State Hospital	Marlboro, N. J.	Psych.
Mountainside Hospital ★	Montclair, N. J.	Gen'l Pract., Int. Med., Path., Surg.
Morristown Memorial Hospital ★	Morristown, N. J.	Path., Rad., Surg.
Burlington County Hospital	Mount Holly, N. J.	Int. Med., Ob.-Gyn., Path., Surg.
Fitkin Memorial Hospital ★	Neptune, N. J.	Int. Med., Path., Ped., Surg.
Babies' Hospital-Coit Memorial	Newark, N. J.	Ped.
Harrison S. Martland Medical Center ★	Newark, N. J.	Int. Med., Ob.-Gyn., Otol., Path., Surg., Urol.
Hospital for Crippled Children	Newark, N. J.	Ortho., Surg.
Newark Beth Israel Hospital ★	Newark, N. J.	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Newark Eye and Ear Infirmary	Newark, N. J.	Ophth., Otol.
Presbyterian Hospital ★	Newark, N. J.	Path., Surg.
St. Barnabas Medical Center ★	Newark, N. J.	Path., Plas. Surg.
St. Michael's Hospital ★	Newark, N. J.	Int. Med., Ob.-Gyn., Path., Ped.
St. Peter's General Hospital ★	New Brunswick, N. J.	Int. Med., Path., Surg.
New Jersey Orthopedic Hospital and Dispensary	Orange, N. J.	Ortho. Surg.
Orange Memorial Hospital ★	Orange, N. J.	Ortho. Surg., Path., Surg.
Bergen Pines County Hospital ★	Paramus, N. J.	Card. Dis., Int. Med., Path., Psych., Pul. Dis.
Passaic General Hospital ★	Passaic, N. J.	Ob.-Gyn., Path.
St. Mary Hospital ★	Passaic, N. J.	Path.
Barnert Memorial Hospital ★	Paterson, N. J.	Path.
Paterson General Hospital ★	Paterson, N. J.	Obst., Path.
St. Joseph Hospital ★	Paterson, N. J.	Anes., Ortho. Surg., Path.
Perth Amboy General Hospital ★	Perth Amboy, N. J.	Path.
Princeton Hospital	Princeton, N. J.	Gen'l Pract.
New Jersey Neuro-Psychiatric Institute	Skillman, N. J.	Psych.
Somerset Hospital ★	Somerset, N. J.	Gen'l Pract.
Overlook Hospital ★	Summit, N. J.	Gen'l Pract., Path.
Holy Name Hospital ★	Teaneck, N. J.	Obst.
Mercer Hospital ★	Trenton, N. J.	Int. Med., Path.
New Jersey State Hospital	Trenton, N. J.	Psych.
St. Francis Hospital ★	Trenton, N. J.	Ob.-Gyn., Path., Ped., Surg.
Essex County Sanatorium	Verona, N. J.	Pul. Dis.
Bataan [illegible]al	Albuquerque, N. Mex.	Int. Med., Path.
Bernal [illegible] ★	Albuquerque, N. Mex.	Int. Med., Ob.-Gyn., Path., Ped.
Veterar [illegible]	Albuquerque, N. Mex.	Int. Med., Path., Pul. Dis., Surg.
Carrie [illegible]	Truth or Consequences, N. Mex.	Ortho. Surg.
Albany Hospital ★	Albany, N. Y.	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Anthony N Brady Maternity Hospital	Albany, N. Y.	Obst.
Bender Hygienic Laboratory	Albany, N. Y.	Path.
St. Peter's Hospital ★	Albany, N. Y.	Ped., Surg.
State of New York	Albany, N. Y.	Pub. Health
Veterans Admin. Hospital	Albany, N. Y.	Int. Med., Neur., Path., Phys. Med., Psych., Rad., Surg.
River Crest Sanitarium	Astoria, N. Y.	Psych.
Binghamton City Hospital ★	Binghamton, N. Y.	Int. Med., Path
Binghamton State Hospital	Binghamton, N. Y.	Psych.
Lawrence Hospital ★	Bronxville, New York	Path.
Beth-El Hospital ★	Brooklyn	Anes., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Brooklyn Eye and Ear Hospital	Brooklyn	Ophth., Otol.
Brooklyn Hospital ★	Brooklyn	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Brooklyn State Hospital	Brooklyn	Psych.
Brooklyn Women's Hospital	Brooklyn	Ob.-Gyn.
Coney Island Hospital ★	Brooklyn	Ob.-Gyn., Path., Ped., Surg.
Cumberland Hospital ★	Brooklyn	Ob.-Gyn., Path., Ped., Rad., Surg.
Greenpoint Hospital ★	Brooklyn	Ob.-Gyn., Path., Surg.
House of St. Giles the Cripple	Brooklyn	Ortho. Surg.
Jewish Chronic Disease Hospital	Brooklyn	Int Med., Neur., Ortho. Surg., Path., Phys. Med.
Jewish Hospital ★	Brooklyn	Allergy, Anes., Card. Dis., Gastro., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Rad., Surg., Urol.
Kings County Hospital ★	Brooklyn	Anes., Path., Ped., Rad.
Division I	Brooklyn	Derm., Int. Med., Ortho. Surg., Otol., Plas. Surg., Pul. Dis., Surg., Thor. Surg., Urol.
Division II	Brooklyn	Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Psych., Pul. Dis., Surg., Thor. Surg., Urol.
Long Island College Hospital ★	Brooklyn	Int. Med., Neuro. Surg., Ob.-Gyn., Otol., Path., Ped., Rad., Surg., Urol.
Lutheran Medical Center ★	Brooklyn	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg., Urol.
Maimonides Hospital ★	Brooklyn	Anes., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg., Urol.
Methodist Hospital ★	Brooklyn	Anes., Int. Med., Ob.-Gyn., Path., Ped., Surg.
St. Catheri [illegible] ★	Brooklyn	Anes., Int. Med.. Ob.-Gyn., Path., Ped., Surg.
St. Charles [illegible] Clinic	Brooklyn	Ortho. Surg
St. John's [illegible]	Brooklyn	Int. Med., Ob.-Gyn., Path., Ped., Surg.
St. Mary's [illegible]	Brooklyn	Int. Med., Ob.-Gyn., Path., Ped., Surg.
Unity Hospital ★	Brooklyn	Ob.-Gyn.

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Name	Location	Approved Residencies
Veterans Admin. Hospital	Brooklyn	Anes., Gastro., Int. Med., Neur. Ophth., Ortho. Surg., Path., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Wyckoff Heights Hospital ★	Brooklyn	Ob.-Gyn., Ped., Surg.
Allied Hospitals of Sisters of Charity ★	Buffalo	Ob.-Gyn., Surg.
Buffalo General Hospital ★	Buffalo	Allergy, Anes., Card. Dis., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Proct., Rad., Surg., Thor. Surg., Urol.
Buffalo State Hospital	Buffalo	Psych.
Children's Hospital ★	Buffalo	Ortho. Surg., Ped. Allergy, Ped., Surg.
Deaconess Hospital ★	Buffalo	Int. Med., Ob.-Gyn., Path., Rad., Surg.
Edward J. Meyer Memorial Hospital ★	Buffalo	Anes., Derm., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Emergency Hospital of the Sisters of Charity	Buffalo	Int. Med., Surg.
Mercy Hospital ★	Buffalo	Gen'l Pract.
Millard Fillmore Hospital ★	Buffalo	Anes., Gen'l Pract., Int. Med., Ob.-Gyn., Path., Proct., Rad., Surg., Urol.
[illegible]	Buffalo	Derm., Int. Med., Path., Rad., Surg.
[illegible]	Buffalo	Anes., Int. Med., Ortho. Surg., Path., Rad., Surg., Thor. Surg.
[illegible]	[illegible]a, N. Y.	Psych.
[illegible]	[illegible]t, N. Y.	Thor. Surg.
Central Islip State Hospital	Central Islip, N. Y.	Psych.
Clifton Springs Sanitarium and Clinic	Clifton Springs, N. Y.	Int. Med., Surg.
Mary Imogene Bassett Hospital ★	Cooperstown, N. Y.	Int. Med., Ob-Gyn., Path., Ped., Surg.
Elmhurst General Hospital ★	Elmhurst, N. Y.	Ob-Gyn., Ophth., Otol., Path., Ped., Phys. Med., Pul. Dis., Rad., Surg., Urol.
Arnot-Ogden Memorial Hospital ★	Elmira, N. Y.	Path.
St. Joseph's Hospital ★	Elmira, N. Y.	Path.
Nassau County Tuberculosis Hospital	Farmingdale, N. Y.	Pul. Dis.
Flushing Hospital and Dispensary ★	Flushing, N. Y.	Anes., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Community Hospital at Glen Cove ★	Glen Cove, N. Y.	Gen'l Pract., Path.
Hillside Hospital	Glen Oaks, N. Y.	Psych.
Glens Falls Hospital ★	Glens Falls, N. Y.	Path.
Headquarters, First U. S. Army	Governors Island, N. Y.	Pub. Health
St. Vincent's Hospital	Harrison, N. Y.	Psych.
Gowanda State Homeopathic Hospital	Helmuth, N. Y.	Psych.
Meadowbrook Hospital ★	Hempstead, N. Y.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Plas. Surg., Psych., Rad., Surg., Urol.
Irvington House	Irvington, N. Y.	Card. Dis.
Cornell University Infirmary	Ithaca, N. Y.	Int. Med.
Tompkins Memorial Hospital	Ithaca, N. Y.	Int. Med.
Jamaica Hospital	Jamaica, N. Y.	Int. Med., Ob.-Gyn., Surg.
Mary Immaculate Hospital ★	Jamaica, N. Y.	Obst., Ped., Surg.
Queens General Hospital ★	Jamaica, N. Y.	Int. Med. Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Rad., Surg., Urol.
Triboro Hospital	Jamaica, N. Y.	Pul. Dis., Thor. Surg.
Charles S. Wilson Memorial Hospital ★	Johnson City, N. Y.	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Kings Park State Hospital	Kings Park, N. Y.	Psych.
Kingston Hospital	Kingston, N. Y.	Gen'l Pract.
Ulster County Tuberculosis Hospital	Kingston, N. Y.	Path., Pul. Dis.
Our Lady of Victory Hospital ★	Lackawanna, N. Y.	Gen'l Pract.
Niagara Sanatorium	Lockport, N. Y.	Pul. Dis
St. Johns Long Island City Hospital ★	Long Island City, N. Y.	Path.
North Shore Hospital	Manhasset, N. Y.	Int. Med., Ob.-Gyn., Path., Ped., Surg.
Marcy State Hospital	Marcy, N. Y.	Psych.
Middletown State Homeopathic Hospital	Middletown, N. Y.	Psych.
Nassau Hospital ★	Mineola, N. Y.	Ob.-Gyn., Ortho. Surg., Path., Surg.
Veterans Admin. Hospital	Montrose, N. Y.	Psych.
Mount Morris Tuberculosis Hospital	Mount Morris, N. Y.	Pul. Dis., Thor. Surg.
Mount Vernon Hospital ★	Mount Vernon, N. Y.	Int. Med., Ob.-Gyn., Path., Surg.
Long Island Jewish Hospital ★	New Hyde Park, L. I., N. Y.	Anes., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
New Rochelle Hospital ★	New Rochelle, N. Y.	Int. Med., Path., Surg.
Babies Hospital	New York City	Surg.
Beekman-Downtown Hospital	New York City	Int. Med., Surg.
Bellevue Hospital Center		
Div. I—Columbia University ★	New York City	Int. Med., Pul. Dis., Surg., Thor. Surg.
Div. II—Cornell University ★	New York City	Int. Med., Neur., Surg., Urol.
Div. III—New York University College of Medicine ★	New York City	Int. Med., Neur., Ob.-Gyn., Path., Ped., Phys. Med., Psych., Rad., Surg.
Div. IV—New York University Post-Graduate Medical School ★	New York City	Anes., Derm., Int. Med., Neuro. Surg., Ophth., Ortho. Surg., Otol., Surg., Urol.
Beth Israel Hospital ★	New York City	Anes., Int. Med., Neuro. Surg., Ob-Gyn., Path., Ped., Plas. Surg., Rad., Surg., Urol.
Bird S. Coler Memorial Hospital and Home	New York City	Int. Med., Phys. Med.
Bronx Eye and Ear Infirmary	New York City	Ophth.
Bronx Hospital ★	New York City	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Bronx Municipal Hospital Center ★	New York City	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Phys. Med., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
City of New York	New York City	Pub. Health
[illegible] ★	New York City	Int. Med., Surg.
[illegible]	New York City	Path.
[illegible]	New York City	Anes., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
[illegible]	New York City	Neur., Ob-Gyn., Path., Ped., Surg., Urol.
42nd Street Beth David Hospital ★	New York City	Int. Med., Ob.-Gyn., Surg.
Francis Delafield Hospital	New York City	Gyn., Int. Med., Path., Plas. Surg., Rad., Surg., Urol.
French Hospital ★	New York City	Int. Med., Ob.-Gyn., Surg., Urol.
Goldwater Memorial Hospital	New York City	
Columbia Univ. Division		Int. Med.
Open Div.		Ophth., Path., Phys. Med., Surg.
Third New York University Research Unit		Int. Med., Neur.
Gouverneur Hospital	New York City	Surg.
Harlem Eye and Ear Hospital	New York City	Ophth., Otol.
Harlem Hospital ★	New York City	Anes., Int. Med., Ob.-Gyn., Path., Ped., Surg.
Hospital for Joint Diseases ★	New York City	Anes., Gyn., Int. Med., Ortho. Surg., Path., Phys. Med., Rad., Surg.
Hospital for Special Surgery	New York City	Ortho. Surg.
Jewish Memorial Hospital ★	New York City	Ob.-Gyn., Path., Surg.
Knickerbocker Hospital ★	New York City	Gyn., Int. Med., Path., Surg.
Lebanon Hospital ★	New York City	Path., Surg.,
Lenox Hill Hospital ★	New York City	Anes., Card. Dis., Int. Med., Neur., Ob-Gyn., Ophth., Path., Ped., Psych., Rad., Surg.
Lincoln Hospital ★	New York City	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg., Urol.
Manhattan Eye, Ear and Throat Hospital	New York City	Ophth., Otol.
Manhattan State Hospital	New York City	Psych.
Memorial Center for Cancer and Allied Diseases	New York City	Anes., Card. Dis., Int. Med., Path., Rad., Surg.
Metropolitan Hospital	New York City	Anes., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Phys. Med., Pul. Dis., Rad., Surg., Thor. Surg., Urol.

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Misericordia Hospital ★	New York City	Int. Med., Obst., Path., Ped., Surg.
Montefiore Hospital ★	New York City	Anes., Int. Med., Neur., Neuro. Surg., Ophth., Path., Phys. Med., Pul. Dis., Rad., Surg., Thor. Surg.
Morrisania City Hospital ★	New York City	Int. Med., Ob.-Gyn., Path., Ped., Pul. Dis., Rad., Surg., Urol.
Mother Cabrini Memorial Hospital ★	New York City	Surg.
Mount Sinai Hospital ★	New York City	Anes., Cardio. Dis., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Psych., Rad., Surg., Urol.
New York Eye and Ear Infirmary	New York City	Ophth., Otol.
New York Hospital ★	New York City	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Otol., Path., Ped., Plas. Surg., Psych., Rad., Surg., Urol.
New York Infirmary ★	New York City	Int. Med., Ob.-Gyn., Ped., Surg.
New York Polyclinic Medical School and Hospital ★	New York City	Anes., Derm., Gastro., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Rad., Surg., Urol.
New York State Psychiatric Institute and Hospital	New York City	Psych.
New York University-Bellevue Medical Center University Hospital	New York City	Derm., Gyn., Int. Med., Path., Ped., Psych., Rad.
Presbyterian Hospital ★	New York City	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Plas. Surg., Psych., Rad., Surg., Urol.
Roosevelt Hospital ★	New York City	Allergy, Gyn., Int. Med., Otol., Path., Ped. Allergy, Ped., Psych., Rad., Surg., Urol.
St. Barnabas Hospital for Chronic Diseases	New York City	Int. Med., Path.
St. Clare's Hospital ★	New York City	Anes., Ob.-Gyn., Path., Ped., Surg., Urol.
St. Francis Hospital ★	New York City	Int. Med., Ob.-Gyn., Path., Ped.
St. Joseph Hospital for Chest Diseases	New York City	Pul. Dis., Thor. Surg.
St. Luke's Hospital ★	New York City	Anes., Card. Dis., Derm., Int. Med., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Psych., Rad., Surg., Urol.
St. Vincent's Hospital ★	New York City	Anes., Int. Med., Neuro. Surg., Ob-Gyn., Ophth., Path., Ped., Phys. Med. Psych., Rad., Surg.
Sydenham Hospital ★	New York City	Int. Med., Ob.-Gyn., Surg.
Veterans Admin. Hospital	New York City (Bronx)	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ophth., Ortho. Surg., Otol., Path., Phys. Med., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg.. Urol.
Veterans Admin. Hospital	New York City (Manhattan)	Derm., Int. Med., Neur., Ophth., Ortho. Surg., Path., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Woman's Hospital	New York City	Ob.-Gyn.
Veterans Admin. Hospital	Northport, N. Y.	Psych.
St. Lawrence State Hospital	Ogdensburg, N. Y.	Psych.
Homer Folks Tuberculosis Hospital	Oneonta, N. Y.	Pul. Dis., Thor. Surg.
Rockland State Hospital	Orangeburg, N. Y.	Psych.
J. N. Adam Memorial Hospital	Perrysburg, N. Y.	Pul. Dis.
High Point Hospital	Port Chester, N. Y.	Psych.
United Hospital ★	Port Chester, N. Y.	Obst., Path., Surg.
St. Charles Hospital	Port Jefferson, N. Y.	Ortho. Surg.
Hudson River State Hospital	Poughkeepsie, N. Y.	Psych.
Vassar Brothers Hospital ★	Poughkeepsie, N. Y.	Path.
Creedmoor State Hospital	Queens Village, N. Y.	Psych.
Raybrook State Tuberculosis Hospital	Raybrook, N. Y.	Pul. Dis., Thor. Surg.
Astor Home for Children	Rhinebeck, N. Y.	Psych.
Genesee Hospital ★	Rochester, N. Y.	Anes., Int. Med.. Ob.-Gyn., Path., Ped., Rad., Sugr.
Highland Hospital ★	Rochester, N. Y.	Int. Med., Ob.-Gyn., Surg.
Monroe County-Iola Sanatorium	Rochester, N. Y.	Pul. Dis.
Rochester General Hospital ★	Rochester, N. Y.	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Rad., Surg.
Rochester State Hospital	Rochester, N. Y.	Psych.
St. Mary's Hospital ★	Rochester, N. Y.	Anes., Gen'l Pract., Int. Med., Ob.-Gyn., Ophth., Path., Ped., Rad., Surg.
Strong Memorial-Rochester Municipal Hospital ★	Rochester, N. Y.	Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped. Allergy, Ped., Plas. Surg., Psych., Rad., Surg., Urol.
University of Rochester School of Medicine and Dentistry	Rochester, N. Y.	Occ. Med.
St. Francis Sanatorium for Cardiac Children	Roslyn, L. I., N. Y.	Card. Dis.
U. S. Naval Hospital ★	St. Albans, N. Y.	Anes., Int. Med., Ob.-Gyn., Ophth., Path., Rad., Surg., Thor. Surg.
Ellis Hospital ★	Schenectady, N. Y.	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Psych., Surg.
Glenridge Sanatorium	Schenectady, N. Y.	Pul. Dis.
U. S. Public Health Service Hospital ★	Stapleton (Staten Island), N. Y.	Anes., Derm., Int. Med., Ophth., Path., Psych., Rad., Surg., Urol.
St. Vincent's Hospital ★	Staten Island, N. Y.	Ortho. Surg., Path.
Sea View Hospital	Staten Island, N. Y.	Ortho. Surg., Path., Pul. Dis., Thor. Surg.
Staten Island Hospital ★	Staten Island, N. Y.	Path.
Veterans Admin. Hospital	Sunmount, N. Y.	Pul. Dis., Thor. Surg.
General Hospital ★	Syracuse, N. Y.	Ob.-Gyn.
Onondaga Sanatorium	Syracuse, N. Y.	Pul. Dis.
St. Joseph's Hospital ★	Syracuse, N. Y.	Anes., Ob.-Gyn., Path.
State University of New York Medical Center ★	Syracuse, N. Y.	Anes.. Int. Med., Ob-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Psych., Rad., Surg., Urol.
Syracuse Psychiatric Hospital	Syracuse, N. Y.	Psych.
Veterans Admin. Hospital	Syracuse, N. Y.	Int. Med., Ortho. Surg., Path., Psych., Pul. Dis., Rad., Surg., Urol.
Letchworth Village	Thiells, N. Y.	Psych.
Samaritan Hospital ★	Troy, N. Y.	Path.
Utica State Hospital	Utica, N. Y.	Path., Psych.
Grasslands Hospital ★	Valhalla, N. Y.	Anes., Card. Dis., Int. Med., Ophth., Path., Ped., Psych., Pul. Dis., Rad., Surg.
Pilgrim State Hospital	West Brentwood, N. Y.	Psych.
Rehabilitation Hospital	West Haverstraw, N. Y.	Ortho. Surg.
New York Hospital-Westchester Division	White Plains, N. Y.	Psych.
White Plains Hospital ★	White Plains, N. Y.	Int. Med., Surg.
Willard State Hospital	Willard, N. Y.	Psych.
Harlem Valley State Hospital	Wingdale, N. Y.	Psych.
St. John's Riverside Hospital ★	Yonkers, N. Y.	Path.
North Carolina Memorial Hospital ★	Chapel Hill, N. C.	Anes., Gen'l Pract., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Thor. Surg., Urol.
Charlotte Memorial Hospital ★	Charlotte, N. C.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Surg., Thor. Surg., Urol.
Mercy Hospital	Charlotte, N. C.	Gen'l Pract.
Presbyterian Hospital	Charlotte, N. C.	Path.
Duke Hospital ★	Durham, N. C.	Allergy, Anes., Card. Dis., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Ped. Allergy, Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Lincoln Hospital	Durham, N. C.	Ob.-Gyn., Surg.
McPherson Hospital	Durham, N. C.	Ophth., Otol.
Veterans Admin. Hospital	Durham, N. C.	Anes., Int. Med., Neuro. Surg., Ophth., Ortho. Surg., Otol., Path., Plas. Surg., Psych., Rad., Surg., Urol.
Watts Hospital ★	Durham, N. C.	Int. Med., Ob-Gyn., Path., Ped.
U. S. Army Hospital ★	Fort Bragg, N. C.	Surg.
North Carolina Orthopedic Hospital	Gastonia, N. C.	Ortho. Surg.
Moses H. Cone Memorial Hospital ★	Greensboro, N. C.	Path.

★ Indicates hospitals approved for training interns.

Name	Location	Approved Residencies
Veterans Admin. Hospital	Oteen, N. C.	Path., Pul. Dis., Thor. Surg
Rex Hospital ★	Raleigh, N. C.	Ob.-Gyn Ped., Surg.
St. Agnes Hospital	Raleigh, N. C.	Ob.-Gyn. Surg.
State Hospital	Raleigh, N. C.	Psych.
State of North Carolina	Raleigh, N. C.	Pub. Health
Babies Hospital	Wilmington, N. C.	Ped.
City Memorial Hospital ★	Winston-Salem, N. C.	Gen'l Pract., Int. Med., Ped., Surg.
Kate Bitting Reynolds Memorial Hospital ★	Winston-Salem, N. C.	Surg
North Carolina Baptist Hospital ★	Winston-Salem, N. C.	Anes., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path , Ped., Psych., Rad., Surg., Thor. Surg., Urol.
Bismarck Hospital	Bismarck, N. Dak.	Int. Med. Rad. Surg.
St. Luke's Hospital ★	Fargo, N. Dak.	Int. Med., Ob.-Gyn., Surg.
Akron City Hospital ★	Akron, Ohio	Gen'l Pract., Int. Med , Ob.-Gyn., Ortho. Surg., Path., Rad., Surg., Urol.
Akron General Hospital ★	Akron, Ohio	Gen'l Pract., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Rad., Surg.
Children's Hospital	Akron, Ohio	Ortho. Surg., Ped.
St. Thomas Hospital ★	Akron, Ohio	Gen'l Pract., Int. Med., Ob.-Gyn., Surg.
Barberton Citizens Hospital ★	Barberton, Ohio	Gen'l Pract.
Veterans Admin. Hospital	Brecksville, Ohio	Pul. Dis.
Aultman Hospital ★	Canton, Ohio	Int. Med , Ob.-Gyn., Path., Rad., Surg.
Mercy Hospital ★	Canton, Ohio	Anes., Gen'l Pract., Int. Med., Ob.-Gyn., Path., Rad., Surg.
Bethesda Hospital ★	Cincinnati	Ob -Gyn., Path.
Children's Hospital	Cincinnati	Neuro. Surg., Ortho. Surg., Ped., Surg.
Christ Hospital ★	Cincinnati	Anes., Gen'l Pract., Int. Med., Neuro. Surg., Plas. Surg., Surg.
Cincinnati General Hospital ★	Cincinnati	Card. Dis., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth , Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Deaconess Hospital	Cincinnati	Surg.
Good Samaritan Hospital ★	Cincinnati	Gen'l Pract., Int. Med., Neuro. Surg., Path., Ped., Rad., Surg.
Jewish Hospital ★	Cincinnati	Int. Med., Ortho. Surg., Path., Ped., Rad., Surg.
Longview State Hospital	Cincinnati	Psych.
St. Mary's Hospital ★	Cincinnati	Cardio. Dis., Int. Med., Surg.
University of Cincinnati, Institute of Industrial Health	Cincinnati	Occ. Med.
Veterans Admin. Hospital	Cincinnati	Int. Med., Neuro. Surg., Psych., Surg., Urol.
Cleveland Clinic Hospital ★	Cleveland	Anes., Card. Dis., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Cleveland Receiving Hospital and State Institute of Psychiatry	Cleveland	Psych.
Cuyahoga County Hospital ★	Cleveland	Anes., Derm., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Otol., Path., Ped., Phys. Med., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Evangelical Deaconess Hospital ★	Cleveland	Ob.-Gyn , Path., Surg.
Fairview Park Hospital ★	Cleveland	Anes., Gen'l Pract., Int. Med , Ob.-Gyn., Surg.
Highland View—Cuyahoga County Hospital	Cleveland	Int. Med., Phys. Med.
Huron Road Hospital ★	Cleveland	Anes , Int. Med., Ob.-Gyn., Path., Rad., Surg., Urol.
Lutheran Hospital ★	Cleveland	Int. Med., Obst., Path., Surg.
Mount Sinai Hospital ★	Cleveland	Anes., Int. Med., Ob.-Gyn., Ortho Surg., Path., Rad., Surg.
Polyclinic Hospital	Cleveland	Gen'l Pract
St. Alexis Hospital ★	Cleveland	Anes., Obst., Surg.
St. Ann Hospital	Cleveland	Ob.-Gyn.
St. John's Hospital ★	Cleveland	Int. Med., Ob.-Gyn., Surg.
St. Luke's Hospital ★	Cleveland	Anes., Int. Med , Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Rad., Surg.
St. Vincent Charity Hospital ★	Cleveland	Int. Med , Path., Rad., Surg.
Sunny Acres, Cuyahoga County Tuberculosis Hospital	Cleveland	Pul. Dis., Thor. Surg.
University Hospitals ★	Cleveland	Anes., Card. Dis., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth , Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Veterans Admin. Hospital	Cleveland	Gastro., Int. Med., Neuro. Surg., Ophth., Ortho. Surg., Otol., Path., Phys. Med., Psych., Rad., Surg., Thor. Surg., Urol.
Woman's Hospital	Cleveland	Gen'l Pract.
Benjamin Franklin Hospital	Columbus, Ohio	Thor. Surg
Children's Hospital	Columbus, Ohio	Ortho. Surg., Otol., Path., Ped., Surg.
Columbus State Hospital	Columbus, Ohio	Psych.
Grant Hospital ★	Columbus, Ohio	Path.
Mount Carmel Hospital ★	Columbus, Ohio	Gen'l Pract., Int. Med., Ob.-Gyn., Ortho. Surg., Surg., Thor. Surg.
Ohio State University Hospitals		
Columbus Phychiatric Institute and Hospital	Columbus, Ohio	Psych.
Ohio Tuberculosis Hospital	Columbus, Ohio	Pul. Dis , Thor. Surg.
University Hospital ★	Columbus, Ohio	Allergy, Anes. Aviat. Med., Card Dis., Gastro., Int. Med., Neur., Neuro Surg., Ob.-Gyn., Occ. Med., Ophth., Ortho. Surg., Otol., Path., Phys. Med., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
St. Ann Hospital for Women	Columbus, Ohio	Ob.-Gyn.
St. Anthony Hospital	Columbus, Ohio	Gen'l Pract.
White Cross Hospital ★	Columbus, Ohio	Card. Dis., Gen'l Pract., Int. Med., Neuro. Surg., Ob.-Gyn., Ortho. Surg., Path., Surg.
Good Samaritan Hospital ★	Dayton, Ohio	Gen'l Pract., Int. Med., Ob.-Gyn. Surg.
Miami Valley Hospital ★	Dayton, Ohio	Gen'l Pract., Int. Med., Obst., Path., Rad., Surg.
St. Elizabeth Hospital ★	Dayton, Ohio	Surg.
Veterans Admin. Hospital	Dayton, Ohio	Int. Med., Path., Phys. Med., Rad., Surg., Urol.
Wright-Patterson Air Force Base	Dayton, Ohio	Aviat. Med
Elyria Memorial Hospital and Gates Hospital for Crippled Children ★	Elyria, Ohio	Gen'l Pract. Ortho. Surg., Path., Rad.
Euclid-Glenville Hospital ★	Euclid, Ohio	Gen'l Pract
Marymount Hospital ★	Garfield Heights, Ohio	Anes., Int. Med., Ob.-Gyn., Surg.
Mercy Hospital ★	Hamilton, Ohio	Anes., Int. Med., Ob.-Gyn., Path., Surg.
Lakewood Hospital ★	Lakewood, Ohio	Int. Med., Ob.-Gyn , Surg.
Lima Memorial Hospital ★	Lima, Ohio	Gen'l Pract., Int. Med., Ob.-Gyn., Surg.
St. Rita's Hospital ★	Lima, Ohio	Gen'l Pract. Int. Med., Ob.-Gyn., Path., Surg.
St. Joseph Hospital ★	Lorain, Ohio	Rad.
Mansfield General Hospital	Mansfield, Ohio	Surg.
Springfield City Hospital ★	Springfield, Ohio	Path.
Ohio Valley Hospital ★	Steubenville, Ohio	Gen'l Pract.
Flower Hospital ★	Toledo, Ohio	Surg.
Maumee Valley Hospital ★	Toledo, Ohio	Int. Med., Obst., Path., Surg.
Mercy Hospital ★	Toledo, Ohio	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
St. Charles Hospital ★	Toledo, Ohio	Gen'l Pract., Psych.
St. Vincent's Hospital ★	Toledo, Ohio	Gen'l Pract., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Surg., Urol.
Toledo Hospital ★	Toledo, Ohio	Gen'l Pract., Int. Med., Ob.-Gyn., Path.
St. Joseph [illegible]	Warren, Ohio	Gen'l Pract.
[illegible]	Warren, Ohio	Int. Med., Ob.-Gyn., Path., Ped., Surg.
[illegible]	Worthington, Ohio	Psych.

★ Indicates hospitals approved for training interns.

Name	Location	Approved Residencies
St. Elizabeth Hospital ★	Youngstown, Ohio	Int. Med., Ob.-Gyn., Path., Surg.
Youngstown Hospital ★	Youngstown, Ohio	Anes., Gen'l Pract., Int. Med., Ortho. Surg., Path., Proct., Rad., Surg.
Central Oklahoma State Hospital	Norman, Okla.	Psych.
Bone and Joint Hospital and McBride Clinic	Oklahoma City	Ortho. Surg.
St. Anthony Hospital ★	Oklahoma City	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Surg.
State of Oklahoma	Oklahoma City	Pub. Health.
University Hospitals ★	Oklahoma City	Anes., Card. Dis., Derm., Gen'l Pract., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Veterans Admin. Hospital ★	Oklahoma City	Anes., Card. Dis., Derm., Int. Med., Neur., Ortho. Surg., Psych., Rad., Surg., Urol.
Wesley Hospital ★	Oklahoma City	Int. Med., Rad., Surg.
Hillcrest Medical Center ★	Tulsa, Okla.	Ob.-Gyn., Path., Ped., Surg.
St. John's Hospital ★	Tulsa, Okla.	Int. Med., Ob.-Gyn., Path., Ped., Plas. Surg., Rad., Surg.
Emanuel Hospital ★	Portland, Ore.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Surg.
Good Samaritan Hospital ★	Portland, Ore.	Int. Med., Neuro. Surg., Path., Surg.
Providence Hospital ★	Portland, Ore.	Int. Med., Path., Rad., Surg.
St. Vincent's Hospital ★	Portland, Ore.	Gen'l Pract., Int. Med., Path., Rad., Surg.
Shriner's Hospital for Crippled Children	Portland, Ore.	Ortho. Surg.
State of Oregon	Portland, Ore.	Pub. Health
University of Oregon Medical School Hospitals and Clinics ★	Portland, Ore.	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Rad., Surg., Thor. Surg., Urol.
Veterans Admin. Hospital	Portland, Ore.	Card. Dis., Gastro., Int. Med., Neuro. Surg., Ortho. Surg., Otol., Path., Phys. Med., Surg., Urol.
Oregon State Hospital	Salem, Ore.	Psych.
Abington Memorial Hospital ★	Abington, Pa.	Int. Med., Ob.-Gyn., Path., Psych., Rad., Surg.
Allentown Hospital ★	Allentown, Pa.	Int. Med., Ob.-Gyn., Path., Plas. Surg., Proct., Surg.
Allentown State Hospital	Allentown, Pa.	Psych.
Sacred Heart Hospital ★	Allentown, Pa.	Int. Med., Path., Rad., Surg.
Altoona Hospital ★	Altoona, Pa.	Gen'l Pract., Ob.-Gyn., Path. Surg.
St. Luke's Hospital ★	Bethlehem, Pa.	Gen'l Pract., Int. Med., Ob.-Gyn., Path. Surg.
Bradford Hospital	Bradford, Pa.	Surg.
Bryn Mawr Hospital ★	Bryn Mawr, Pa.	Int. Med., Path., Rad., Surg.
Chester Hospital ★	Chester, Pa.	Gen'l Pract., Path.
Veterans Admin. Hospital	Coatesville, Pa.	Psych.
Danville State Hospital	Danville, Pa.	Psych.
George F. Geisinger Memorial Hospital ★	Danville, Pa.	Anes., Derm., Gen'l Pract., Int. Med., Ob.-Gyn., Ortho. Surg., Otol., Path., Ped., Rad., Surg.
Fitzgerald-Mercy Hospital ★	Darby, Pa.	Gen'l Pract., Ob.-Gyn. Path., Rad.
Eagleville Sanatorium for Consumptives	Eagleville, Pa.	Pul. Dis.
Easton Hospital ★	Easton, Pa.	Int. Med., Surg.
State Hospital for Crippled Children	Elizabethtown, Pa.	Ortho. Surg.
Embreeville State Hospital	Embreeville, Pa.	Psych.
Hamot Hospital ★	Erie, Pa.	Int. Med., Ortho. Surg., Path., Rad., Surg., Urol.
St. Vincent's Hospital ★	Erie, Pa.	Path., Rad., Surg., Urol.
Chas. H. Miner State Hospital	Hamburg, Pa.	Pul. Dis.
Harrisburg Hospital ★	Harrisburg, Pa.	Int. Med., Ob.-Gyn., Path., Ped., Surg., Urol.
Harrisburg Polyclinic Hospital ★	Harrisburg, Pa.	Int. Med., Path., Ped., Surg.
Harrisburg State Hospital	Harrisburg, Pa.	Psych.
Hazleton State Hospital	Hazleton, Pa.	Surg.
Conemaugh Valley Memorial Hospital ★	Johnstown, Pa.	Anes., Path.
Lancaster General Hospital ★	Lancaster, Pa.	Path.
St. Joseph's Hospital ★	Lancaster, Pa.	Path.
Mayview State Hospital	Mayview, Pa.	Psych.
Montgomery Hospital ★	Norristown, Pa.	Gen'l Pract., Path.
Norristown State Hospital	Norristown, Pa.	Psych.
Sacred Heart Hospital ★	Norristown, Pa.	Gen'l Pract. Surg.
Albert Einstein Medical Center Northern Division ★	Philadelphia	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Psych., Rad., Surg., Urol.
Southern Division ★	Philadelphia	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Psych., Rad., Surg., Urol.
Chestnut Hill Hospital ★	Philadelphia	Int. Med., Ob.-Gyn., Rad.
Children's Hospital	Philadelphia	Ortho. Surg., Ped., Surg.
Eastern Pennsylvania Psychiatric Institute	Philadelphia	Psych.
Episcopal Hospital ★	Philadelphia	Int. Med., Ob.-Gyn., Path., Rad., Surg., Thor. Surg., Urol.
Frankford Hospital ★	Philadelphia	Int. Med., Ob.-Gyn., Path., Surg.
Friends Hospital	Philadelphia	Psych.
Germantown Dispensary and Hospital ★	Philadelphia	Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Graduate Hospital of the University of Pennsylvania ★	Philadelphia	Anes., Card. Dis., Derm., Gastro., Gyn., Int. Med., Neur., Neuro. Surg., Ophth., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Pul. Dis., Rad., Surg., Urol.
Hahnemann Medical College and Hospital ★	Philadelphia	Anes., Derm., Int. Med., Neuro. Surg., Ob.-Gyn., Ortho. Surg., Path., Ped., Rad., Surg., Thor. Surg., Urol.
Hospital of the University of Pennsylvania ★	Philadelphia	Anes., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Urol.
Hospital of the Women's College of Pennsylvania ★	Philadelphia	Anes., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Institute of the Pennsylvania Hospital	Philadelphia	Psych.
Jeanes Hospital	Philadelphia	Rad.
Jefferson Medical College Hospital ★	Philadelphia	Anes., Derm., Gastro., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Lankenau Hospital ★	Philadelphia	Int. Med., Ob.-Gyn., Path., Surg.
Mercy-Douglass Hospital ★	Philadelphia	Int. Med., Ob.-Gyn., Surg.
Methodist Episcopal Hospital ★	Philadelphia	Int. Med., Ob.-Gyn., Surg.
Misericordia Hospital ★	Philadelphia	Ob.-Gyn., Path., Surg.
Nazareth Hospital ★	Philadelphia	Int. Med., Rad., Surg.
Pennsylvania Hospital ★	Philadelphia	Anes., Card. Dis., Derm., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Rad., Surg., Urol.
Pennsylvania Hospital-Department for Mental and Nervous Diseases	Philadelphia	Psych.
Philadelphia General Hospital ★	Philadelphia	Anes., Card Dis., Derm., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Phys. Med., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Philadelphia General Hospital—Northern Division	Philadelphia	Pul. Dis.
Philadelphia Psychiatric Hospital	Philadelphia	Psych.

★ Indicates hospitals approved for training interns.

Name	Location	Approved Residencies
Philadelphia State Hospital	Philadelphia	Psych.
Presbyterian Hospital ★	Philadelphia	Anes., Card. Dis., Int. Med., Ob.-Gyn., Path., Rad., Surg., Thor. Surg.
St. Christopher's Hospital for Children	Philadelphia	Ped.
St. Joseph's Hospital ★	Philadelphia	Surg.
St. Luke's and Children's Medical Center	Philadelphia	Ped.
St. Mary's Hospital ★	Philadelphia	Gen'l Pract., Ob.-Gyn., Surg.
Shriners Hospital for Crippled Children	Philadelphia	Ortho. Surg.
Skin and Cancer Hospital	Philadelphia	Derm.
Temple University Hospital	Philadelphia	Allergy, Anes., Card. Dis., Gastro., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Proct., Psych., Rad., Surg., Urol.
U. S. Naval Hospital ★	Philadelphia	Anes., Derm., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Veterans Admin. Hospital	Philadelphia	Cardio. Dis., Int. Med., Ortho. Surg., Path., Phys. Med., Psych., Rad., Surg., Urol.
Wills Eye Hospital	Philadelphia	Ophth.
Woman's Hospital	Philadelphia	Ob.-Gyn., Surg.
Allegheny General Hospital ★	Pittsburgh	Anes., Int. Med., Ortho. Surg., Path., Ped., Rad., Surg., Thor., Surg., Urol.
Children's Hospital	Pittsburgh	Neuro. Surg., Ortho. Surg., Path., Ped., Surg.
Elizabeth Steel Magee Hospital	Pittsburgh	Int. Med., Ob.-Gyn., Path.
Eye and Ear Hospital	Pittsburgh	Ophth., Otol.
Mercy Hospital ★	Pittsburgh	Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Otol., Path., Rad., Surg., Urol.
Montefiore Hospital ★	Pittsburgh	Allergy, Anes., Int. Med., Obst., Ophth., Path., Rad., Surg.
Pittsburgh Hospital ★	Pittsburgh	Int. Med., Ob.-Gyn.
Presbyterian Hospital ★	Pittsburgh	Card. Dis., Int. Med., Neuro. Surg., Ortho. Surg., Path., Plas. Surg., Proct., Rad., Surg., Urol.
St. Clair Memorial Hospital	Pittsburgh	Gen'l Pract.
St. Francis General Hospital and Rehabilitation Institute ★	Pittsburgh	Anes., Card. Dis., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Psych., Rad., Surg.
St. Margaret Memorial Hospital ★	Pittsburgh	Int. Med., Ob.-Gyn., Path., Surg.
Shadyside Hospital ★	Pittsburgh	Path.
South Side Hospital ★	Pittsburgh	Ob.-Gyn., Path.
University of Pittsburgh Graduate School of Public Health	Pittsburgh	Occ. Med.
Veterans Admin. Hospital	Pittsburgh	Allergy., Int. Med., Neur., Ophth., Ortho. Surg., Otol., Path., Phys. Med., Rad., Surg., Urol.
Western Pennsylvania Hospital ★	Pittsburgh	Int. Med., Obst., Path., Rad., Surg.
Western Psychiatric Institute and Clinic	Pittsburgh	Psych.
A. C. Milliken Hospital	Pottsville, Pa.	Gen'l Pract.
Community General Hospital ★	Reading, Pa.	Gen'l Pract., Path.
Reading Hospital ★	Reading, Pa.	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Rad., Surg.
St. Joseph's Hospital ★	Reading, Pa.	Path., Surg.
Robert Packer Hospital ★	Sayre, Pa.	Anes., Int. Med., Neuro. Surg., Ortho. Surg., Path., Ped., Rad., Surg., Urol.
Scranton State Hospital ★	Scranton, Pa.	Path.
Samuel G. Dixon Hospital	South Mountain, Pa.	Pul. Dis.
Warren State Hospital	Warren, Pa.	Psych.
Chester County Hospital ★	West Chester, Pa.	Rad.
Mercy Hospital ★	Wilkes-Barre, Pa.	Surg., Urol.
Wilkes-Barre General Hospital ★	Wilkes-Barre, Pa.	Path., Surg., Urol.
Columbia Hospital ★	Wilkinsburg, Pa.	Surg.
Williamsport Hospital ★	Williamsport, Pa.	Path., Surg.
York Hospital ★	York, Pa.	Path., Surg.
State Hospital for Mental Diseases	Howard, R. I.	Psych.
Newport Hospital ★	Newport, R. I.	Gen'l Pract., Int. Med., Path.
Memorial Hospital ★	Pawtucket, R. I.	Gen'l Pract., Int. Med., Path.
Charles V. Chapin Hospital	Providence, R. I.	Ped., Psych.
Miriam Hospital ★	Providence, R. I.	Anes., Int. Med.
Providence Lying-In Hospital	Providence, R. I.	Obst.
Rhode Island Hospital ★	Providence, R. I.	Anes., Card. Dis., Gyn., Int. Med., Ortho. Surg., Otol., Path., Ped. Allergy, Ped., Rad., Surg., Urol.
Veterans Admin. Hospital	Providence, R. I.	Int. Med., Surg.
Emma Pendleton Bradley Home	Riverside, R. I.	Psych.
Woonsocket Hospital	Woonsocket, R. I.	Gen'l Pract.
Teaching Hospitals of the Medical College of South Carolina ★	Charleston, S. C.	Anes., Int. Med., Neur., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Urol.
Medical College Hospital Roper Hospital		
Columbia Hospital ★	Columbia, S. C.	Int. Med., Ob.-Gyn., Ortho. Surg., Ped., Surg.
Veterans Admin. Hospital	Columbia, S. C.	Int. Med., Surg.
McLeod Infirmary ★	Florence, S. C.	Ob.-Gyn.
Greenville General Hospital ★	Greenville, S. C.	Gen'l Pract., Ob.-Gyn., Ortho. Surg., Path., Ped., Surg.
Shriners Hospital for Crippled Children	Greenville, S. C.	Ortho. Surg.
Spartanburg General Hospital ★	Spartanburg, S. C.	Gen'l Pract., Path., Rad., Surg.
Sioux Valley Hospital ★	Sioux Falls, S. Dak.	Gen'l Pract.
Sacred Heart Hospital ★	Yankton, S. Dak.	Gen'l Pract., Surg.
Baroness Erlanger Hospital ★	Chattanooga, Tenn.	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Rad., Surg.
Memorial Hospital	Chattanooga, Tenn.	Ob.-Gyn., Surg.
Newell Hospital	Chattanooga, Tenn.	Surg.
T. C. Thompson Children's Hospital	Chattanooga, Tenn.	Ped.
East Tennessee Baptist Hospital ★	Knoxville, Tenn.	Ortho. Surg., Path.
East Tennessee Crippled Children's Hospital	Knoxville, Tenn.	Ortho. Surg.
St. Mary's Memorial Hospital ★	Knoxville, Tenn.	Gen'l Pract., Int. Med., Ortho. Surg., Path., Surg.
University of Tennessee Memorial Research Center and Hospital ★	Knoxville, Tenn.	Anes., Gen'l Pract., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Surg.
Baptist Memorial Hospital ★	Memphis, Tenn.	Neuro. Surg., Ob.-Gyn., Path., Ped., Rad., Surg., Urol.
Campbell Clinic Hospital	Memphis, Tenn.	Ortho. Surg
City of Memphis Hospitals ★	Memphis, Tenn.	Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Otol., Path., Ped., Rad., Surg., Urol.
Gailor Memorial Psychiatric Hospital	Memphis, Tenn.	Psych.
LeBonheur Children's Hospital	Memphis, Tenn.	Ped.
Memphis Eye, Ear, Nose and Throat Hospital	Memphis, Tenn.	Ophth.
Methodist Hospital ★	Memphis, Tenn.	Path., Rad., Surg.
St. Joseph's Hospital ★	Memphis, Tenn.	Int. Med., Ob.-Gyn., Path., Ped., Surg.
Veterans Admin. Hospital	Memphis, Tenn.	Gastro., Int. Med., Ophth., Ortho. Surg., Otol., Path., Phys. Med., Pul. Dis., Rad., Surg., Thor. Surg., Urol.

★ Indicates hospitals approved for training interns.

Name	Location	Approved Residencies
West Tennessee Tuberculosis Hospital	Memphis, Tenn.	Pul. Dis., Thor. Surg.
Baptist Hospital ★	Nashville, Tenn.	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Surg.
George W. Hubbard Hospital of Meharry Medical College ★	Nashville, Tenn.	Int. Med., Obst., Path., Ped., Surg., Urol.
Nashville General Hospital ★	Nashville, Tenn.	Int. Med., Ob.-Gyn., Path., Surg.
St. Thomas Hospital ★	Nashville, Tenn.	Int. Med., Ob.-Gyn., Surg.
Vanderbilt University Hospital ★	Nashville, Tenn.	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ortho. Surg., Path., Ped., Psych., Rad., Surg., Thor. Surg., Urol.
Veterans Admin. Hospital	Nashville, Tenn.	Int. Med., Pul. Dis., Rad., Surg.
Oak Ridge Institute of Nuclear Studies	Oak Ridge, Tenn.	Int. Med., Path.
Oakville Memorial Sanatorium	Oakville, Tenn.	Pul. Dis.
Austin State Hospital	Austin, Texas	Psych.
Brackenridge Hospital ★	Austin, Texas	Ob.-Gyn., Path., Surg.
State of Texas	Austin, Texas	Pub. Health
Driscoll Foundation Children's Hospital	Corpus Christi, Texas	Ped.
Baylor University Hospital ★	Dallas, Texas	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Phys. Med., Plas. Surg., Proct., Rad., Surg., Thor. Surg., Urol.
Children's Medical Center ★	Dallas, Texas	Ped. Allergy, Ped.
Gaston Hospital	Dallas, Texas	Surg.
Methodist Hospital ★	Dallas, Texas	Int. Med., Ob.-Gyn., Path., Surg.
Parkland Memorial Hospital ★	Dallas, Texas	Anes., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Path., Psych., Pul. Dis., Rad., Surg., Urol.
St. Paul's Hospital ★	Dallas, Texas	Int. Med., Ob.-Gyn., Path., Ped., Rad.
Texas Scottish Rite Hospital for Crippled Children	Dallas, Texas	Ortho. Surg.
Timberlawn Sanitarium	Dallas, Texas	Psych.
Veterans Admin. Hospital ★	Dallas, Texas	Int. Med., Ophth., Ortho. Surg., Otol., Rad., Surg., Thor. Surg., Urol.
Hotel Dieu ★	El Paso, Texas	Ob.-Gyn.
William Beaumont Army Hospital ★	El Paso, Texas	Int. Med., Ob.-Gyn., Ped., Surg.
All Saints Hospital	Fort Worth, Texas	Gen'l Pract.
Harris Hospital ★	Fort Worth, Texas	Anes., Int. Med., Ob.-Gyn., Path., Surg.
St. Joseph Hospital ★	Forth Worth, Texas	Path.
St. Mary's Hospital	Galveston, Texas	Gen'l Pract.
University of Texas Medical Branch Hospitals ★	Galveston, Texas	Anes., Card. Dis., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Psych., Rad., Surg., Thor. Surg., Urol.
Gonzales Warm Springs Foundation for Crippled Children	Gonzales, Texas	Phys. Med.
Hermann Hospital ★	Houston, Texas	Anes., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Rad., Surg., Urol.
Jefferson Davis Hospital ★	Houston, Texas	Anes., Derm., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Psych., Rad., Surg., Thor. Surg., Urol.
Memorial Hospital ★	Houston, Texas	Gen'l Pract., Path.
Methodist Hospital ★	Houston, Texas	Anes., Derm., Int. Med., Neuro. Surg., Ob.-Gyn., Otol., Path., Ped., Plas. Surg., Psych., Rad., Surg., Thor. Surg., Urol.
St. Joseph's Hospital ★	Houston, Texas	Anes., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg., Urol.
St. Luke's Episcopal Hospital	Houston, Texas	Ob.-Gyn., Surg., Urol.
Southern Pacific Hospital	Houston, Texas	Surg.
Texas Children's Hospital	Houston, Texas	Derm., Path., Ped., Plas. Surg., Surg.
University of Texas M. D. Anderson Hospital for Cancer Research	Houston, Texas	Anes., Gyn., Int. Med., Path., Rad., Surg.
Veterans Admin. Hospital	Houston, Texas	Anes., Derm., Int. Med., Neur., Neuro. Surg., Ophth., Ortho. Surg., Otol., Path., Phys. Med., Plas. Surg., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Nan Travis Memorial Hospital	Jacksonville, Texas	Gen'l Pract
Veterans Admin. Hospital	McKinney, Texas	Int. Med., Path., Pul. Dis., Surg.
U. S. Air Force School of Aviation Medicine	Randolph Field, Texas	Aviat. Med.
Baptist Memorial Hospital ★	San Antonio, Texas	Gen'l Pract., Ob.-Gyn., Path., Rad., Surg.
Brooke Army Hospital ★	San Antonio, Texas	Anes., Card. Dis., Derm., Int. Med., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Plas. Surg., Rad., Surg., Urol.
Robert B. Green Memorial Hospital ★	San Antonio, Texas	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Santa Rosa Hospital ★	San Antonio, Texas	Gen'l Pract., Int. Med., Path., Ped., Rad.
U. S. Air Force Hospital (Lackland) ★	San Antonio, Texas	Anes., Gen'l Pract., Int. Med., Ortho. Surg., Path., Ped., Rad., Surg.
Scott and White Memorial Hospital ★	Temple, Texas	Anes., Int. Med., Ophth., Ortho. Surg., Path., Rad., Surg.
U. S. Air Force Hospital	Wichita Falls, Texas	Surg.
Wichita General Hospital	Wichita Falls, Texas	Gen'l Pract.
St. Benedict's Hospital ★	Ogden, Utah	Gen'l Pract., Path.
Thomas D. Dee Memorial Hospital ★	Ogden, Utah	Anes., Gen'l. Pract., Int. Med., Ob.-Gyn., Path., Surg.
Dr. W. H. Groves Latter-Day Saints Hospital ★	Salt Lake City	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Plas. Surg., Rad., Surg., Thor. Surg.
Holy Cross Hospital ★	Salt Lake City	Int. Med., Ob.-Gyn., Path., Rad. Surg.
Primary Children's Hospital	Salt Lake City	Ortho. Surg.
St. Mark's Hospital ★	Salt Lake City	Rad., Surg.
Salt Lake County General Hospital ★	Salt Lake City	Anes., Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Psych., Rad., Surg.
Shriners Hospital for Crippled Children	Salt Lake City	Ortho. Surg.
Veterans Admin. Hospital ★	Salt Lake City	Int. Med., Neur., Ortho. Surg., Path., Psych., Rad., Surg.
Brattleboro Retreat	Brattleboro, Vt.	Psych.
DeGoesbriand Memorial Hospital ★	Burlington, Vt.	Anes., Gen'l Pract., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Otol., Path., Ped., Rad., Surg., Urol.
Mary Fletcher Hospital ★	Burlington, Vt.	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Otol., Path., Ped., Rad., Surg., Urol.
Vermont State Hospital	Waterbury, Vt.	Psych.
Veterans Admin. Hospital	White River Junction, Vt.	Anes., Int. Med., Neuro. Surg., Ortho. Surg., Surg., Urol.
Alexandria Hospital ★	Alexandria, Va.	Int. Med., Ob.-Gyn.
Arlington Hospital	Arlington, Va.	Ob.-Gyn.
Blue Ridge Sanatorium	Charlottesville, Va.	Pul. Dis.
University of Virginia Hospital ★	Charlottesville, Va.	Allergy, Anes., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Psych., Rad., Surg., Thor. Surg., Urol.
Chesapeake & Ohio Railway Employees Hospital ★	Clifton, Forge, Va.	Int. Med., Surg.
Memorial Hospital ★	Danville, Va.	Path., Urol.
U. S. Army Hospital	Fort Belvoir, Va.	Surg.
Lynchburg General Hospital	Lynchburg, Va.	Path., Surg.
Riverside Hospital ★	Newport News, Va.	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Surg.
De Paul Hospital ★	Norfolk, Va.	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Rad., Surg.
Norfolk Community Hospital	Norfolk, Va.	Gen'l Pract.
Norfolk General Hospital ★	Norfolk, Va.	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Rad., Surg.
U. S. Public Health Service Hospital ★	Norfolk, Va.	Gen'l Pract.
U. S. Naval Hospital ★	Portsmouth, Va.	Int. Med., Ob.-Gyn., Ortho. Surg., Ped., Surg.

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Name	Location	Approved Residencies
Crippled Children's Hospital	Richmond, Va.	Ortho. Surg.
Johnston-Willis Hospital *	Richmond, Va.	Int. Med., Ob.-Gyn., Path., Surg.
Medical College of Virginia—Hospital Division *	Richmond, Va.	Allergy, Anes., Int. Med., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped., Phys. Med., Psych., Rad., Surg., Urol.
Richmond Memorial Hospital *	Richmond, Va.	Path., Surg.
St. Elizabeth Hospital	Richmond, Va.	Surg.
State of Virginia	Richmond, Va.	Pub. Health
Veterans Admin. Hospital	Richmond, Va.	Anes., Card. Dis., Gastro., Int. Med., Neur., Neuro. Surg., Ophth., Ortho. Surg., Path., Phys. Med., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Gill Memorial Eye, Ear and Throat Hospital	Roanoke, Va.	Ophth., Otol.
Jefferson Hospital *	Roanoke, Va.	Int. Med., Surg.
Lewis-Gale Hospital *	Roanoke, Va.	Surg.
Louise Obici Memorial Hospital	Suffolk, Va.	Gen'l Pract.
Eastern State Hospital	Williamsburg, Va.	Psych.
Madigan Army Hospital *	Fort Lewis, Wash.	Int. Med., Ob.-Gyn., Ped., Surg
Children's Orthopedic Hospital *	Seattle	Anes., Ortho. Surg., Ped., Surg.
Doctor's Hospital *	Seattle	Anes., Int. Med., Ob -Gyn., Path., Surg.
Firland Sanatorium	Seattle	Pul. Dis., Thor. Surg.
King County Hospital Unit 1 (Harborview) *	Seattle	Anes., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Path., Ped., Psych , Surg., Urol.
Pinel Foundation	Seattle	Psych.
Providence Hospital *	Seattle	Gen'l Pract., Int. Med., Obst., Ortho. Surg., Path., Rad., Surg.
State of Washington	Seattle	Pub. Health
Swedish Hospital *	Seattle	Anes., Int. Med., Ob.-Gyn., Path., Surg.
U. S. Public Health Service Hospital *	Seattle	Int. Med., Path., Surg.
Veterans Admin. Hospital	Seattle	Anes., Int. Med., Neur., Ortho. Surg., Path., Psych., Surg., Urol.
Virginia Mason Hospital *	Seattle	Anes., Int. Med., Obst., Path., Rad., Surg.
Deaconess Hospital *	Spokane, Wash.	Path.
Sacred Heart Hospital *	Spokane, Wash.	Gen'l Pract., Ob.-Gyn., Path., Rad., Surg.
St. Luke's Hospital *	Spokane, Wash.	Gen'l Pract., Ob.-Gyn., Path.
Shriners Hospital for Crippled Children	Spokane, Wash.	Ortho. Surg.
St. Joseph Hospital *	Tacoma, Wash.	Path.
Tacoma General Hospital *	Tacoma, Wash.	Anes., Path.
Beckley Hospital	Beckley, W. Va.	Surg.
Beckley Memorial Hospital	Beckley, W. Va.	Int. Med., Path., Ped., Surg.
Bluefield Sanitarium	Bluefield, W. Va.	Gen'l Pract.
Charleston General Hospital *	Charleston, W. Va.	Gen'l Pract., Int. Med., Path., Surg.
Kanawha Valley Hospital *	Charleston, W. Va.	Surg.
Memorial Hospital *	Charleston, W. Va.	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Ped., Surg.
St. Mary's Hospital	Clarksburg, W. Va.	Path.
Cabell-Huntington Hospital *	Huntington, W. Va.	Gen'l Pract., Int. Med., Path., Surg.
Chesapeake & Ohio Hospital	Huntington, W. Va.	Int. Med., Surg.
St. Mary's Hospital *	Huntington, W. Va.	Path., Surg.
Veterans Admin. Hospital	Martinsburg, W. Va.	Path., Rad., Surg.
Laird Memorial Hospital	Montgomery, W. Va.	Surg.
Camden-Clark Memorial Hospital *	Parkersburg, W. Va.	Gen'l Pract
St. Joseph's Hospital *	Parkersburg, W. Va.	Gen'l Pract.
Broaddus Hospital	Philippi, W. Va.	Surg.
Ohio Valley General Hospital *	Wheeling, W. Va.	Anes., Gen'l Pract., Int. Med., Path., Surg.
Luther Hospital *	Eau Claire, Wis.	Gen'l Pract.
St. Agnes Hospital *	Fondulac, Wis.	Path.
Mercy Hospital *	Janesville, Wis.	Surg.
La Crosse Lutheran Hospital *	La Crosse, Wis.	Int. Med., Surg.
Madison General Hospital *	Madison, Wis.	Int. Med. Path., Surg., Urol.
Mendota State Hospital	Madison, Wis.	Psych.
Methodist Hospital *	Madison, Wis.	Surg.
St. Mary's Hospital *	Madison, Wis.	Int. Med., Ob.-Gyn.
University Hospitals *	Madison, Wis.	Allergy, Anes., Card. Dis., Derm., Int. Med., Neur., Neuro. Surg., Ob.-Gyn., Ophth., Ortho. Surg., Otol., Path., Ped. Allergy, Ped., Plas. Surg., Psych., Rad., Surg., Urol.
Veterans Admin. Hospital	Madison, Wis.	Pul. Dis.
St. Joseph's Hospital *	Marshfield, Wis.	Int. Med., Surg.
Columbia Hospital *	Milwaukee	Int. Med., Obst., Ortho. Surg., Path., Rad., Surg.
Evangelical Deaconess Hospital *	Milwaukee	Gen'l Pract., Path., Rad., Surg.
Milwaukee Children's Hospital *	Milwaukee	Ortho. Surg., Ped.
Milwaukee County Hospital *	Milwaukee	Gen'l Pract., Int. Med., Ob.-Gyn., Ophth., Path., Ped., Proct., Rad., Surg., Urol.
Milwaukee Hospital *	Milwaukee	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Rad., Surg.
Mount Sinai Hospital *	Milwaukee	Int. Med., Ob.-Gyn.
Muirdale Sanitorium	Milwaukee	Pul. Dis.
St. Joseph's Hospital *	Milwaukee	Int. Med., Ob.-Gyn., Path., Rad., Surg.
St. Luke's Hospital *	Milwaukee	Gen'l Pract., Int. Med., Ob.-Gyn., Path., Rad., Surg.
St. Mary's Hospital *	Milwaukee	Int. Med. Ob.-Gyn., Path.
St. Michael's Hospital *	Milwaukee	Gen'l Pract.
Veterans Admin. Hospital	Milwaukee (Wood)	Anes., Derm., Gastro., Int. Med., Ophth., Ortho. Surg., Otol., Path., Phys. Med., Psych., Pul. Dis., Rad., Surg., Thor. Surg., Urol.
Milwaukee Sanitorium	Wauwatosa, Wis.	Psych.
Gorgas Hospital *	Ancon, C. Z.	Int. Med., Ob.-Gyn., Ophth., Path., Ped., Surg.
Kapiolani Maternity and Gynecological Hospital	Honolulu, T. H.	Ob.-Gyn
Kauikeolani Children's Hospital	Honolulu, T. H.	Ped.
Leahi Hospital	Honolulu, T. H.	Pul. Dis., Thor. Surg.
Queen's Hospital *	Honolulu, T. H.	Int. Med., Ob.-Gyn., Path., Psych., Surg.
St. Francis Hospital *	Honolulu, T. H.	Int. Med., Ob.-Gyn., Path.
Shriners Hospital for Crippled Children	Honolulu, T. H.	Ortho. Surg.
Tripler Army Hospital *	Honolulu, T. H.	Int. Med., Ob.-Gyn., Ortho. Surg., Path., Ped., Rad., Surg., Urol.
Territorial Hospital	Kanoehe, Oahu, T. H.	Psych.
Aguadilla District Hospital *	Aguadilla, P. R.	Path.
Arecibo District Hospital *	Arecibo, P. R.	Gen'l Pract., Path.
Bayamon District Hospital *	Bayamon, P. R.	Int. Med., Ob.-Gyn., Path., Ped., Surg.
Puerto Rico Institute of Psychiatry, Inc.	Bayamon, P. R.	Psych.
Sociedad Espanola De Auxilio Mutuo	Hatorey, P. R.	Gen'l Pract.
Ponce District General Hospital *	Ponce, P. R.	Int. Med., Ob.-Gyn.
Psychiatric Center for Training and Research	Rio Piedras, P. R.	Psych.
Dr. I. Gonzalez Martinez Oncologic Hospital	San Juan, P. R.	Path.
San Juan City Hospital *	San Juan, P. R.	Anes., Int. Med., Ob.-Gyn., Ophth., Path., Ped., Rad., Surg., Urol.
Veterans Admin. Hospital	San Juan, P. R.	Int. Med., Path., Phys. Med., Rad., Surg.

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* Indicates hospitals approved for training interns.

Failure to take an examination constitutes an opportunity just as much as failure to pass an examination. Under extenuating circumstances a candidate may apply for an extension of the three-year period by writing to the Secretary's office prior to the expiration of the three-year period. Under similar circumstances the Board, entirely at its discretion, may excuse a candidate from any scheduled examination without penalty, provided the *request for such absence is* filed prior to time of the examination.

A fee of $50 will be charged for each repeat in the written *and oral examination.* The Board may, however, at its discretion deny a candidate the privilege of reexamination.

If an applicant fails to pass either the written or oral examination within the allowed period, having taken one or more written or *oral* examination, *his* application will be declared void and reapplication will not be allowed.

The Board reserves the right to limit the number of candidates to be admitted to any examination.

FEE

The fee shall be one hundred fifty dollars ($150.00). At *least fifty dollars ($50.00) shall* be paid upon filing the application, of which sum thirty-five dollars ($35.00) shall be returned if the candidate is not accepted for examination. The remainder ($100.00) shall be paid before taking the examination.

The Board is a nonprofit organization. The fees for examination and certification have been computed on a basis of cost of maintaining an administrative office and conducting examinations. The Board reserves the right to change the fee when necessary.

AMERICAN BOARD OF DERMATOLOGY

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GENERAL REQUIREMENTS

Preliminary registration forms are acceptable after the applicant has met the *following requirements:*

1. High ethical and professional standing.
2. Graduation from a medical school approved, at the time of the candidate's graduation, by the Council on Medical Education and Hospitals of the American Medical Association. (Graduates of schools not on the approved list may be eligible provided they pass Part I and Part II of the examinations of the National Board of Medical Examiners.
3. Satisfactory completion of an approved internship.
4. A state license to practice medicine in the United States or Canada issued following examination, or by endorsement of the certificate of the National Board of Medical Examiners, or regular status in the Armed Forces of the United States or Canada.
5. Citizenship in the United States or citizenship by birth in Canada.

SPECIAL REQUIREMENTS

The following minimum requirements have been established for admission to examination:

Formal training in dermatology and related subjects, of not less than three years. This training may be obtained as a resident, fellow, or graduate student in the institutions recognized by the Council on Medical Education and Hospitals of the *American* Medical Association and approved by the joint Residency Review Committee for Dermatology. One month in each year may be taken as a vacation. Vacations may not be postponed from one year to another. Candidates will be eligible for the written examination when a minimum of three full years have elapsed since the beginning of training.

The formal training shall include: At least one year full-time in an institution approved for three-year training in dermatology; graduate training in the basic medical sciences; and carefully supervised clinical and laboratory work.

METHODS OF TRAINING

The preferred method of training is a three-year well-integrated and continuing program in an institution approved for the full training period. At least one year of full-time training in an *institution* approved for three years is required.

However, apart from the required full-time year in such an institution, the *additional* training requirements may be fulfilled by training in *institutions* approved for one year or two years or in part as a preceptee.

Training must be completed within five years except where *military* service or other *compelling* circumstances shall intervene.

Suggestions for the study of Dermatology are given in the Syllabus of Graduate Training.

PRECEPTEESHIP TRAINING

Candidates *may take one year* of their training under the direction of a preceptor approved by the Board. Not more than half of each training day may be spent in the office of the preceptor; during the other half-day training must be undertaken in an approved institution. Although preceptorships may be taken during any *one* of the years of training, it *is* recommended that the preceptee have at least one year of dermatologic training previous to a preceptorship. After preceptees have become diplomates, they will be asked to [illegible] Evaluation Form.

CREDIT FOR MILITARY SERVICE

Candidates *who have served* in the Armed Forces of the United States or Canada as physicians may submit credentials for possible credit toward training or experience. The Supplementary Application form for Military Training should be submitted with the Preliminary Registration form or at the termination of military services.

RESPONSIBILITY

It is the candidate's responsibility to make early contact with the Board, to ascertain and observe its regulations, and to file the preliminary registration and the application for *certification forms.* Candidates must meet all requirements before applying for certification.

Directors of training are responsible for submitting an Annual Graduate Training form on each candidate.

Approved preceptors, in conjunction with the director of training of the institution in which the candidate spends half his training time, are responsible for *submitting* an Annual Graduate Training form on each preceptee.

PRELIMINARY REGISTRATION

Each candidate must file a Preliminary Registration form with the Board at the beginning of training, whether or not plans are complete at the time. This establishes his identity and status as a candidate, and begins his permanent file. It enables the Board to detect any *deficiencies in the plan* of training. No fee is involved at this time.

ESTIMATES OF STATUS

Decisions as to the status of candidates who ask for an estimate of the further *training* needed can be made only by the Committee on Requirements upon submission of an Estimate of Status Form. The *$25 registration fee,* which will be credited toward the application for certification, must accompany *this* form. The Board *acts* as a body and through *duly constituted committees.* Individual members only carry out the rules and regulations of the Board.

APPLICATION FOR CERTIFICATION

Application for certification forms may be filed before the end of the formal training period and must be made before the closing date regularly published in the Examinations and Licensure column of The Journal of the American Medical Association. Dates of examinations are also published here. Applications should be filed during the last year of training in order to obtain full advantage of the loan sets of histopathology slides available from the Armed Forces Institute of Pathology. Application will be considered with the accompanying registration fee of $25, which will not be refunded. When all supporting documents have been received the application is submitted to the Committee on Requirements, which appraises the qualifications of the candidate and decides as to his eligibility for examination. An examination fee of $75 is payable when the candidate is notified that his application is acceptable to the Board.

The total fee of $100 has been carefully computed and is used entirely for administrative purposes. Members of the Board receive no compensation except for actual expenses connected with the examinations.

EXAMINATIONS

Examinations are designed to ascertain the breadth of the candidate's knowledge in the basic as well as the clinical aspects of dermatology and to test his familiarity with the literature and to gauge his general qualifications as a specialist in this branch of medicine.

All applicants for certification must now pass a comprehensive written examination before they are eligible for the oral test. The written examination is held simultaneously in major cities. Applicants are then required to pass the oral clinical and laboratory examination which is conducted in a clinic. Cases will be seen and discussed with each candidate, and the examiners will seek to ascertain his knowledge of dermatology as well as of various related subjects.

Candidates whose applications have been accepted may take the next examination after the completion of training. Except in special circumstances, an applicant shall take the examination within a year following the filing of application. A candidate once accepted for an examination will henceforth remain eligible for only two succeeding examinations, unless some compelling circumstance, such as military service, shall intervene.

Candidates who have signified their intention of taking the examination and who fail to appear, or who cancel their request after the final notice has gone out, shall forfeit the examination fee.

The Board's records are confidential throughout. Examination marks will not be divulged. The findings of the Board are subject to its discretion and are final. Applications are accepted on this understanding.

PRECEPTORS AND PRECEPTEE TRAINING

Preceptors are diplomates of the Board of at least five years standing in active practice, recognized teachers of professorial rank, on the active staff of an institution approved for three years of graduate training in dermatology.

Precepteeships are now granted for only one year of graduate training. The preceptee must not spend more than one-half of his time in the preceptor's office. The remainder must be spent under supervision in an institution approved for three years of graduate training in dermatology. His work program should be based on not less than a 40-hour week.

A Preceptee Work Plan is filed with the Secretary of the Board previous to acceptance of each preceptee. Following the preceptorship, the preceptor, in conjunction with the director of training of the institution in which the candidate spends half his training time, submits an Annual Graduate Training form on each preceptee.

Each dermatologist who wishes to become a preceptor must file an Application for Preceptorship form with the Board. (The Committee on Education passes on these applications.) Detailed qualifications, rules, and regulations as well as duties and rights of preceptors and preceptees will be sent to dermatologists on request.

AMERICAN BOARD OF INTERNAL MEDICINE

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GENERAL QUALIFICATIONS

1. All candidates must be citizens of the United States or Canada.
2. All candidates must be licensed to practice medicine in a state, territory, or possession of the United States or Canada.
3. All candidates must present evidence of satisfactory moral and ethical standing in the medical profession.

PROFESSIONAL QUALIFICATIONS

1. Graduation from a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association at the date of graduation.
2. Satisfactory completion of an approved internship of not less than 12 months.*
3. Residency or fellowship approved by the Council on Medical Education and Hospitals of the American Medical Association in internal medicine according to the following plan (Plan A) or one of the alternate plans described under paragraph 4.

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*During the period in which the 9-9-9 program was in effect an approved internship of nine months will satisfy the requirement of twelve months. A residency of nine months is considered as nine months only.

(Plan A) A residency or fellowship in internal medicine for a period of not less than three years in a hospital or other institution approved by the Council on Medical Education and Hospitals of the American Medical Association for residency or fellowship in internal medicine. In such instances in which a resident's nominal status differs from that of the other hospital residents, he must furnish the Board with certification by the Chief of the Medical Service and the Medical Director of the Hospital that he actually performed the full duties of a resident as a bonafide member of the residency program. In addition, two years of adequate clinical experience in the practice of internal medicine following graduate training will be required. The Board will accept the following equivalents as satisfying one year only, of the three years of residency or fellowship to which this paragraph refers. (Two years must be in the field of general internal medicine.)

(a) If 12 months of a two-year approved internship in a hospital approved for residency training in internal medicine is limited to the medical service and the medical specialties, credit will be granted for a first year of assistant residency. The remaining two years of residency training must be in the general field of internal medicine. Certification by the Chief of the Medical Service as to compliance with this requirement must accompany application.

(b) One year of approved residency in one of the medical specialties: Allergy, Cardiovascular Disease, Gastro-Enterology, Hematology, Pathology, Pulmonary Diseases, Neurology, Pediatrics, Psychiatry, Dermatology, and Syphilology, provided the candidate completes in addition, two full years of approved residency in the general field of internal medicine.

(c) One year as a medical graduate student or as a medical graduate instructor in an approved medical school on a full-time basis in Bacteriology, Biochemistry, Pathology, Pharmacology, Physiology, or Internal Medicine.

(d) An advanced degree in the Medical Sciences, provided the work has been done and the degree obtained after graduation from medical school.

NOTE: Graduate training credit for the time involved will be allowed candidates who take and satisfactorily complete post-graduate courses in internal medicine or the basic medical sciences provided by accredited medical schools on a full time basis. This ruling shall not apply to courses of less than three months or more than twelve months duration. A certification of creditable performance, based in part, at least, on a formal examination upon completion of the course, will be required.

NOTE: Fellowship or Research assignments not approved by the Residency Review Committee in Internal Medicine will require certification by the Chief of Service that such assignments were equivalent in graduate training opportunities and patient responsibilities to those of approved residencies in Internal Medicine or the sub-specialties recognized by this Board. This certification must be presented with application.

4. Alternate Training Plans: The Board firmly believes that the plan of intensive training prescribed above offers the best opportunity for a young physician to prepare himself to meet his responsibilities as a specialist in internal medicine. It is recognized, however, that capable individuals may accomplish the same result in a longer period of time during which the training is less intensive. The Board realizes that a number of medical graduates cannot follow the shorter and more desirable plan either because suitable residencies are not available or in some instances because of personal and economic reasons. Accordingly the Board has modified its previous regulations governing eligibility for admission to examination. In doing so the Board has not modified its standards of examination. It has liberalized its eligibility requirements for admission to examination by accepting half-time formal training, and the practice of internal medicine under circumstances favorable as to professional and hospital contacts, in lieu of part of the full-time requirements. It is hoped that by this means exceptional individuals may acquire a knowledge of medicine and experience in its application sufficient to qualify for examination.

The program previously described (Plan A), which consists of three years of formal training in an approved residency or its equivalent, following internship, and followed by two additional years in the practice of internal medicine, is recommended by the Board. Variations in this program are now subject to the following regulations:

(a) In all instances, one year of approved internship and one year of approved residency will be required, except as indicated under Plan G. The graduate training credit of one year heretofore granted as a result of active duty as a commissioned officer in the Armed Forces during the period beginning December 7, 1941, and ending January 1, 1947, and during the Korean emergency beginning June 1, 1950, and ending July 1, 1954, may not be applied in satisfaction of the one year of approved residency referred to in Plans D, E, F, unless the candidate's assignment is considered by the Board to have been equivalent to an approved residency.

(b) Following one year of internship and two years of approved residency, the remaining requirements may be satisfied by:

(Plan B) That is by two years of half-time formal training followed by two years of practice limited to internal medicine or by

(Plan C) That is, by five years of practice limited to internal medicine.

(c) Following one year of internship and one year of approved residency, the remaining requirements may be satisfied by:

(Plan D)* That is, by four years of half-time formal training followed by two years of practice limited to internal medicine or by

(Plan E)* That is, by two years of half-time formal training followed by five years of practice limited to internal medicine, or by

(Plan F) That is, by eight years of practice limited to internal medicine.

(d) (Plan G) Physicians who have practiced internal medicine for 12 years following an approved internship may qualify for the examinations without further training.

(e) (Plan H) In order to better the opportunity for adequate graduate education in terms of the requirements of this Board, a special plan (Plan H) has been designed. This plan is exclusive. It is reserved for Chairmen of Departments of Medicine in approved medical schools in the United States and Canada, who may wish to recommend for admission to examination certain men who have planned a career in academic medicine, but whose training has not satisfied the requirements of any of the other "PLANS" authorized by the Board. Candidates may not elect Plan H at the time they make application. Specific recommendations that a candidate be qualified under this plan must be made by a Chairman of a Department of Medicine in a Class A Medical School in the United States or Canada. This recommendation must assure that the candidate has been under the jurisdiction and guidance of him or other persons whom he has selected or recommended during a five-year period of training after internship; that this training has been shaped with the idea that the candidate has been preparing for an academic career; and that during the training period the candidate has had adequate direct responsibility for patient care in the broad field of Internal Medicine. This Plan is intended for the unusual candidate. Each application will be individually considered by the Executive Committee of the Board.

It will be the responsibility of Heads of Departments of Medicine to affirm to the American Board of Internal Medicine that the candidate is qualified for admission to examination after a minimum of five years of training. It may well be that the Head of the Department will require additional years of training beyond the minimum before stating the qualifications of the candidate to the Board. A candidate thus recommended under the foregoing provisions will be examined by the Board in the broad field of internal medicine.

If, during the period of training under Plan H, the candidate decides to qualify under one of the other plans of the Board (A to G) credit will be granted on the basis of the requirements of Plans A to G.

Half-time formal training under expanded plans B, D, and E is defined as follows:

1. Half-time* as an instructor in clinical medicine in a recognized medical school in the United States or Canada.
2. Half-time* in a research fellowship sponsored by a recognized medical school in the United States or Canada.
3. Half-time* as a graduate student in an approved medical school in the United States or Canada.

5. Practice Requirements: A period of not less than two years (to be completed by the time of the first written examination) of adequate clinical experience in the practice of internal medicine. This requirement may be satisfied by independent practice or in association with a recognized internist following completion of formal training. If teaching or research assignments are broad enough to merit practice credit, please ask Chief of Service or Chairman of the Department of Medicine to certify that assignments are equivalent to the practice of medicine as it is commonly known. Adequate experience in the care of clinical patients would include full responsibility for inpatients as well as outpatients. The certification referred to should accompany application.

6. Graduates of Foreign Medical Schools: All candidates who are graduates of foreign medical schools must meet the following requirements as a minimum:

(a) The physician must be a citizen of the United States.

(b) The physician must furnish proof in the form and to the extent deemed adequate by the Board that he (or she) has graduated from a medical school after completing a four year full-time course in medicine.

(c) The physician must have a license to practice in one or more states of the United States and have been in active practice confined to Internal Medicine within the state of legal residence for at least two years.

(d) Graduates of foreign medical schools prior to 1930 may qualify under the alternate plans of the Board the same as graduates of approved medical schools in the United States.

(e) Graduates of foreign medical schools in 1930 and thereafter must, in addition to all other requirements, satisfy the requirements of one year of approved internship and three years of approved residency or fellowship in the United States, followed by at least two years of practice limited to the field of Internal Medicine in the United States. If, however, their school of graduation is "recognized" by the Council on Medical Education and Hospitals of the American Medical Association, graduates of Foreign Schools may qualify under the various plans of the Board the same as graduates of approved Medical Schools in the United States.

7. Candidates Graduating Prior to 1937: Candidates graduating from approved medical schools in the United States or Canada prior to 1937 may qualify for admission to examination provided their practice has been limited to internal medicine for at least two years prior to application and provided they are identified as internists by their colleagues in their community.

8. Preceptor Training: Preceptor type training is not recognized in satisfaction of any part of the three-year requirement of formal graduate training.

9. Credit for Service in the Medical Corps of the Armed Forces of the United States an Canada.

(a) Active duty as a commissioned officer in the Medical Corps prior to January 1, 1947, may be applied as one year of residency credit or one year of practice credit, regardless of assignment.

(b) Active duty as a commissioned officer in the Medical Corps for period June 1, 1950, to July 1, 1954, may be applied as one year of residency credit or one year of practice credit regardless of assignment.

(c) Active duty as a commissioned officer in the Medical Corps after July 1, 1954, may be applied as practice credit provided the candidate had previously satisfied the requirements of graduate training. Certification of Chiefs of Service that assignments were in the field of Internal Medicine on a full-time basis in the care of clinical patients largely on one's own responsibility is required.

(d) Residency credit automatically granted for active service in the Medical Corps of the Armed Forces was discontinued as of July 1, 1954.

10. Graduates of The Chicago Medical School, prior to approval by the Council on Medical Education and Hospitals of the American Medical Association, and graduates of the Middlesex School of Medicine, who received their degree in medicine prior to January 1, 1951, and who have fulfilled all of the requirements set forth in Section 2 (Requirements for admission to Examination and Certification), and an approved residency or fellowship of three years duration (Plan A) and followed by two years of practice in Internal Medicine may apply, and at the discretion of the Executive Committee or of the Board may be admitted to examination.

PRINCIPLES OF TRAINING

The American Board of Internal Medicine is interested in the fact that the candidate has embarked on a career of study voluntarily and has thereby expressed the desire to excel and to participate personally in the world's progress in Medicine.

Preparation must be based on years of continuous thoughtful study. Therefore, in suggesting a program for those who wish advice, the Board hopes to assist the candidates to avoid inferior and superficial programs which may lead to failure and disappointment in later years.

The Board believes that all internists should have a sound fundamental knowledge of Anatomy, Bacteriology, Biochemistry, Pathology, Pharmacology, and Physiology. Such knowledge is essential to the continued progress of any internist. The Board anticipates that adequate training will be obtained in the basic sciences as applied to internal medicine during a formal three-year residency program.

The Board wishes to emphasize that time and training are but a means to the end of acquiring a broad knowledge of internal medicine which the candidate must demonstrate to the Board in order to justify it in certifying that he is competent to practice internal medicine as a specialty. The responsibility of acquiring the knowledge rests with the candidate. The responsibility of maintaining the standards of knowledge required for certification rests with the Board.

APPLICATION

Candidates for examination must make their application on a prescribed form which may be obtained from the office of the Executive-Secretary-Treasurer.

The application must contain a record of the candidate's premedical and medical training as well as of internships, residencies, graduate study, hospital or dispensary staff appointments, teaching positions, service in the armed forces, membership in medical societies, medical papers published, and the names of four well-known internists to whom the Board may write for professional and character reference.

The application must be accompanied by one recent, signed photograph of the candidate mounted on the application, and the registration and examination fee of forty dollars ($40.00) to cover the written examination, of which twenty-five dollars ($25.00) will be refunded if the application is disapproved. Upon application for admission to the oral examination, an additional fee of fifty dollars ($50.00) will be required. Upon notification of certification by the Board, a further fee of ten dollars ($10.00) to cover cost of certification will be required.

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*Half-time formal training is regarded as four hours per day for six days per week. It is required that half-time formal training be verified by the head of the department. Verification must accompany application.

Applications must be filed by May 1 of the year concerned and all requirements must be satisfied by October 1 of the year concerned.

The requirements of graduate training followed by two years of practice in the field of internal medicine must be satisfied before a candidate is eligible for admission to examination.

If three or more years elapse before a candidate completes his certification, the Board will require the candidate to file a new application.

METHOD OF EXAMINATION—WRITTEN AND ORAL

1. The examinations for certification by the Board comprise two parts: Part I is written; Part II is clinical and is an oral examination. The written examination is held simultaneously in different sections of the United States, Canada, and outside continental limits of the United States wherever eligible candidates are located. Only one written examination will be given each year. This examination will be held on the third Monday in October. This examination is divided into a morning and afternoon period for each of which three hours are allowed. The questions are of the multiple-choice type, framed in such manner as the Board elects, and designed to test the candidate's basic clinical acumen and his knowledge of applied physiology, anatomy, physiological chemistry, pathology, bacteriology, and pharmacology as related to internal medicine.

2. Candidates must pass the written examination before admission to the oral examination will be authorized. Oral examinations are held near the time and place of the annual meetings of the American Medical Association and the American College of Physicians and at such other times and places as the Board may designate. Announcements of all oral examinations will appear in the *Annals of Internal Medicine* and THE JOURNAL of the American Medical Association. Applications cannot be accepted until the schedule is announced in the publications referred to and cannot be accepted after closing date is announced.

3. The oral examination will be conducted under the direct supervision of the Board. It will be given by members of the Board of Internal Medicine with the assistance of such Guest Examiners as may be selected. Oral examinations are conducted at the bedside of each of two patients previously assigned to each candidate. Forty-five minutes will be allowed for the examination of each of the patients before the candidate is examined orally. Candidates will be expected to present in a concise, orderly fashion pertinent facts in history and diagnosis. Demonstration of important physical findings will be requested by the examiner. During the oral examination, questions will be asked concerning diagnostic and therapeutic procedures related to the problems under discussion and to any other aspects of Internal Medicine. Conciseness and clarity of statements as well as evidence of clinical maturity will be searched for, in addition to factual knowledge. Furthermore, the candidate should be prepared to demonstrate his ability to interpret objective demonstrations of roentgenologic, pathologic, hematologic, electrocardiographic and other abnormalties.

Revised Requirements Governing Readmission to the Written and Oral Examinations

To: All Candidates eligible for readmission to the Written and Oral Examinations of this Board.

I. Written Examination

1. The interval between written examinations will be not less than one year.

2. The number of written examinations for which a candidate may apply is not limited.

3. A fee of twenty-five dollars ($25.00) is required for each written reexamination. This fee is due upon application for reexamination.

II. Oral Examination

1. The interval between oral examinations will be not less than one year.

2. Candidates failing the oral examination three times, must reapply for admission to the written examination. After passing the written examination again, candidates become subject to the same regulations and priorities in respect to the oral examination as apply to candidates who pass the written examination for the first time.

3. A fee of fifty dollars ($50.00) is required for each oral reexamination. This fee is due upon application for reexamination.

The effective date of the changes referred to governing readmission to the written and oral examinations was February 1, 1958, and will apply to examinations taken after February 1, 1958.

AMERICAN BOARD OF NEUROLOGICAL SURGERY

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JOHN RAAF, Portland, Ore.
LEONARD T. FURLOW, Secretary-Treasurer, 600 S. Kingshighway, St. Louis 10

GENERAL QUALIFICATIONS

1. Moral and ethical standing in the profession satisfactory to the board of directors.

2. It shall be discretionary with the board to accept for examination candidates who have been in neurosurgical practice more than six years but whose formal training fails to meet full requirements.

3. Properly qualified candidates who are permanent residents in and citizens of other countries and are legally qualified to practice medicine there and who have received their training in neurological surgery in the United States of America or Canada may apply for certification by the American Board of Neurological Surgery.

4. A special certificate may be issued to foreign (not United States of America or Canadian citizens) candidates who have received their training in neurological surgery in the United States of America or Canada and who are returning to their own country at the end of their training period, upon passing successfully the regular examinations of the board, without completion of the requirement of two years in the practice of neurological surgery. This special certificate shall be appropriately identified to distinguish it from the regular certificate of this board.

PRELIMINARY PROFESSIONAL STANDING

1. Graduation from a medical school that is acceptable to the American Board of Neurological Surgery.

2. (a) Completion of a surgical internship of not less than one year in a hospital acceptable to the Board, or its equivalent in the opinion of the Board, plus a period of graduate study of not less than four years beyond the year of general surgical training in an approved hospital, or in a recognized graduate school of medicine, acceptable to the American Board of Neurological Surgery. Of this training period, at

least 30 months must be devoted to clinical neurological surgery. The training in clinical neurological surgery must be progressive and not obtained during repeated short periods in a number of institutions. It is necessary that at least two years of this training be had in one institution, and the Board will not ordinarily approve periods of training in clinical neurological surgery of less than one year.

OR

2. (b) Completion of a rotating internship of not less than one year in a hospital acceptable to the Board or its equivalent in the opinion of the Board, plus a period of graduate study of not less than four years beyond the year of rotating internship in an approved hospital, or in an accredited school of medicine acceptable to the American Board of Neurological Surgery. Of this training a period of at least six months must be in an approved clinical program in general surgery, and at least thirty months must be devoted to clinical neurological surgery. The training in clinical neurological surgery must be progressive and not obtained during repeated short periods in a number of institutions. It is necessary that at least two years of this training be had in one institution, and the Board will not ordinarily approve periods of training in clinical neurological surgery of less than one year.

Furthermore, the candidate must prepare himself to pass a Board examination in general surgery, organic neurology, neuropathology, neuroanatomy, neurophysiology, and neuroradiology.

The Board does not accept training by preceptorship.

An additional period of not less than two years of satisfactory independent practice of neurological surgery.

The above represents only the minimum requirements of eligibility for examination for certification by the Board.

APPLICATIONS

An application on the official application blank in order to be considered at any meeting must be in the hands of the secretary-treasurer of the Board not less than six months before the date of such meeting.

PAYMENT OF FEES

The fee for certification shall be one hundred fifty dollars ($150.00). The candidate for examination, on filing his application, shall accompany it with an application fee of twenty-five dollars ($25.00). The application fee will not be returned even though the application for examination is denied. When notified by the Secretary-Treasurer that he is eligible for examination, he shall send the examination fee of one hundred twenty-five dollars ($125.00) to the Secretary-Treasurer at least two weeks before the date of the examination.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

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Herbert E. Schmitz, Vice-president, Chicago
Lawrence M. Randall, Assistant Secretary, Rochester, Minn.
Walter T. Dannreuther, New York City
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R. Gordon Douglas, New York City
Carl P. Huber, Indianapolis
Curtis J. Lund, Rochester, N. Y.
Reed B. Dawson, Esq., Counsel, New York City
Robert L. Faulkner, Secretary-Treasurer, 2105 Adelbert Rd., Cleveland, Ohio

REQUIREMENTS

Each applicant, before he may become eligible to apply for examination, must establish the following facts:

1. The possession of the degree of Doctor of Medicine from an institution of learning approved by the Council on Medical Education and Hospitals of the American Medical Association.

2. That he is a physician of high ethical and professional standing duly licensed to practice medicine in the United States or Canada and is a member of a County or District Medical Society.

3. The completion of at least one year of intern service in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association. The Board accepts the fifth or "intern" medical school year required by some schools in lieu of the usual fifth or intern year of clinical training following graduation.

4. The completion of seven years of training and practice after the first intern year to include at least three years of Progressive Residency Training in clinical obstetrics-gynecology in approved institutions. Approved Preceptorship training may be substituted in part for Residency training, as explained on pages 20 and 21.

5. Following completion of acceptable training, two years of post-training practice, limited to the specialty, are required before application for examination can be made. Post-training practice may include practice within the specialty as an assistant or associate or independent practice. Periods of Residency in obstetrics-gynecology in excess of the required three years will not be accepted as a substitute for any part of the two required years of post-training practice except in the cases of men advancing from the Residency Training into and planning to remain in full-time faculty positions in Medical Schools and their affiliated hospitals.

6. That he is limiting his practice to obstetrics and/or gynecology and intends to continue to do so, except for possible military duty.

7. The Board conformed with the general acceleration in programs in medical education in that it will accept a period of nine "accelerated" months as an academic year in satisfying our requirements for each of three years of residency training. Such allowances can be made only for services during the wartime period of the official "accelerated program" and are not made for services before 1943 or after the discontinuance of this acceleration in 1946.

8. Applicants who have been certified by one of the other American Specialty Examining Boards will not be eligible for certification by this Board until they have relinquished the certificate previously conferred, except upon special action to the contrary taken by the American Board of Obstetrics and Gynecology.

9. The Board has ruled that physicians who accept male patients in their private or other practice, for operative or other care, cannot be regarded as specialists in obstetrics and gynecology, except by special ruling when this is related to active military duty.

10. This Board deprecates engagement in fields of practice other than that in which candidates profess to be specialists. The sole exception to this provision is that it is permissible for candidates and diplomates of the American Board of Obstetrics and Gynecology to participate in Emergency Care.

11. This Board will not accept applicants for examination who are not full citizens of the United States or of Canada. Foreign born applicants must have been certified by either the National Board of Medical Examiners or licensed to practice medicine in the United States or Canada by a State or Provincial Board of Licensure. Notarized statements, not original citizenship papers, must be furnished when the application is filed attesting to the fact of full citizenship in the United States or Canada, if the applicant is foreign born.

Further, there will be required a probationary period of at least three (3) years from the date of licensure in the practice of medicine in these countries before such a candidate may be admitted to examination.

SPECIAL CREDITS AND RULINGS

1. Physicians otherwise qualified, who were graduated before January 1, 1939, and whose required training was in obstetrics or gynecology alone, and who have confined their practice to obstetrics or gynecology for at least five (5) years immediately prior to application may be accepted for examination as candidates for certification in either obstetrics or gynecology. In all other respects requirements for eligibility remain the same as for those physicians graduated since 1939. At least a fundamental knowledge of both obstetrics and gynecology is essential, regardless of whether a candidate's practice is limited to one or the other branch.
2. Basic science training should emphasize the relation of anatomy, pathology, physiology, biochemistry, and bacteriology to the application of surgical principles which are fundamental in all branches of surgery. More especially for this specialty there should be training in infertility, endocrinology, oncology, irradiation therapy, electrotherapy, psychosomatic medicine, and other nonoperative methods of diagnosis and treatment. In addition, the candidate must understand and be trained in the care of emergencies, shock, hemorrhage, blood replacement, electrolyte and fluid balance, protein and nitrogen balance, choice of anesthetics, chemotherapy, acidosis and alkalosis, narcotics and hypnotics, wound healing, etc.
3. After July 1, 1958, this Board will not allow credit within the three years required training period for separately organized basic science courses which remove the candidate from clinical training in obstetrics and/or gynecology.
4. Training in abdominal surgery, in addition to the required three (3) years of training in clinical obstetrics and gynecology, is desirable and may be included in the total minimal seven (7) years required after the intern year.
5. Applicants on service in obstetrics-gynecology under orders in hospitals of the Army, Navy, Air Force, and Public Health Service will receive residency training credit if such hospitals are officially approved for training in this specialty.

When the hospital is not approved, Preceptorship Training credit may be allowed if the service is supervised by a Diplomate of this Board or an otherwise qualified obstetrician and gynecologist. If such training credit is desired, candidates must comply with the regulation governing Preceptorships as published on pages 20 and 21 of this bulletin. In addition, the Medical Officers Professional Training Record should be completed and attested while in military service.

Credit toward the required two years of post-training practice, limited to this specialty, will not be allowed for service in the Armed Forces except in the case of regular medical officers who have completed the training requirements.

APPLICATION AND FEES

Application must be made on a special blank which will be furnished by the Secretary's Office and must be forwarded with the other required credentials and the application fee to the Secretary's Office not later than September 1 of each year. Commencing in 1959 this date will be advanced to August 1 of each year.

All candidates must comply with Board regulations in effect for one year in which the examination is taken, regardless of when the original application was filed.

Candidates applying for admission to the examinations for certification are required to submit with their application, an unbound typewritten list, on 8½-by-11-in. paper, of all patients admitted to the hospitals where they practice, for the year preceding their application or the year prior to their request, for reopening of their application, with the age, parity, diagnosis, pathological diagnosis, nature of treatment, and end result.

The list should conform to page 23 of this Bulletin and be certified by the hospital librarian, administrator, or superintendent.

The application fee is $35.00 and is not returnable.

The examination fee is $100.00 and is payable when the candidate is notified of acceptance for examination. This fee is not returnable after the candidate has been officially accepted by the Credentials Committee and notified to report for examination.

If the candidate fails the Part II examination on his original application, he may exercise the privilege of one reexamination (see Examinations, Part II) but will be required to pay a fee of $25.00 for such reexamination upon making request that his application be reopened for this purpose.

The fees have been carefully computed on a basis of cost of examinations and are used entirely for administrative expenses. Examiners and Associate Examiners serve as such without compensation other than actual expenses.

APPRAISAL OF INCOMPLETE TRAINING

Many prospective candidates write the Secretary's Office outlining in their letters their training qualifications and asking informally if they are eligible, if this training has been sufficient and, if not, what is still lacking. Any candidate should be able to make a fair estimate of his eligibility after studying this Bulletin.

However, if the candidate wishes an informal evaluation of qualifications, a form "Application for Appraisal of Incomplete Training" should be requested from the Secretary of the Board. The request should be accompanied by a check for $15.00 to cover the clerical expense involved. Prospective candidates are reminded that this appraisal is not official and is subject to review and final decision by the Credentials Committee when they consider the application for admission to examination.

Appraisal of Incomplete Training forms should not be filed if Application for admission to examination has already been filed. This is unnecessary duplication.

Official interviews cannot be granted by the Secretary or other Directors of the Board unless requested by the Board.

Applicants declared ineligible for admission to examination may request reopening of their applications within two (2) years of the filing date without payment of an additional application fee. When a candidate requests that his application be reopened, he must supply the Board with information to justify such further consideration. A request for the reopening of an application declared ineligible by reason of insufficient training, nonlimitation of practice, or similar items may not be approved in less than two (2) years, although application may be made as specified above to avoid payment of an additional fee. This approval time may be reduced under exceptional circumstances. The request must have adequate supporting evidence of additional training and experience to warrant reconsideration. Supplemental Training blanks should be used for such reports, and these will be supplied upon request.

After two ineligibility or postponement rulings on any candidate's application, an entirely new application must be submitted (with or without fee, according to current requirements) in order to bring data down to date. The essential feature of this should be evidence of additional training and experience.

Applicants declared eligible but who fail to exercise the examination privilege within three (3) years of the date of filing the application are required to file a new and current application and to pay a new application fee. Candidates should offer as sponsors or references, two Diplomates of this Board with whom they are presently in contact rather than men under whom they served as residents only. It is required that sponsors be from the candidate's community and currently acquainted with the candidate and his ability in his practice of the specialty.

When notice of acceptance for admission to examination has been received by the candidate it should be immediately acknowledged and the examination fee paid. Case reports must be forwarded to the Secretary within thirty (30) days.

EXAMINATIONS

Part I examinations are scheduled for January 16, 1959. Arrangements will be made for candidates to report in any convenient city where there may be a Diplomate of this Board to conduct or to supervise the written examination which will be sent out from the Board's Office under sealed cover.

Special arrangements will be made through senior officers for conducting the written portion of the Part I examination for men in military service. Such candidates are requested to keep the Secretary's Office informed at all times of changes in their mailing addresses.

All applicants accepted for examination will be required to obtain a passing grade in both the written examination and a review of case reports (Part I), before becoming eligible for the oral clinical and pathology examinations (Part II). The passing grade for the written examination and case reports is 75%. A candidate whose grade in either or both falls below 75% is conditioned. Reexamination for the removal of conditions in Part I may be taken after one year but within three years after the first failure, without payment of an additional fee.

Requests for reexamination in the written portion of Part I and requests for resubmission of case reports must be filed prior to September 1 of each year. Candidates who successfully complete the Part I examination proceed automatically to the Part II examination held later in the year.

Requests for reexamination in Part II must be made prior to September 1 of each year.

Candidates appearing for reexamination under a new application after two previous failures will not be required, if they have passed all or part of the Part I examinations on their first application, to repeat such examination items already successfully cleared.

Part I

Examination consists of:

1. A comprehensive written examination, conducted annually, including questions on both obstetrics and gynecology and related basic sciences. The written examination will be limited to a maximum period of three hours.

2. The evaluation of twenty (20) important obstetrical and gynecological case reports in condensed form. Five (5) of the twenty (20) cases may concern major illnesses not necessarily operative. These reports must include a variety of material rather than a number of reports of one type. Case reports from one's residency service shall not be more than five (5) in number.

CASE REPORTS

In the case of candidates applying for unilateral certification, case reports must pertain to the branch for which application is made.

Men holding full-time Medical School faculty appointments may submit the remainder of their case records from this full-time, nonprivate practice, but post-training service. (See Requirements.) The candidate should prepare and maintain in his possession a carbon copy of his case records in case of possible loss in shipping.

Evidence of adequate follow-up examination pertinent to each individual case must be submitted.

The candidate should submit separate verified index lists, in duplicate, for each individual hospital at which operations were performed. All of these must be formally signed by the responsible hospital official (preferably the hospital superintendent), attesting in each instance that the candidate was the operator.

Part II

The oral clinical and pathology examinations given all candidates are conducted by the entire Board and the Associate Examiners. Advance announcements of examination dates and place will be made in medical journals throughout the country. (Scheduled for Chicago, May 8 to 19, 1959.)

Examination consists of:

1. Oral examination before three or more examiners. All endeavor is made to adapt the details of the oral examination to each candidate's experience and practice. The examination is particularly directed to ascertain his familiarity with recent obstetrical and gynecological literature, the related basic sciences, the breadth of his clinical experience, and his general qualifications as a specialist in obstetrics and gynecology.

2. Pathology examination. The candidate is expected to identify and to discuss pathologic specimens and microscopic sections.

Examiners report orally upon each candidate to the assembled Board, after which the results of their investigations are considered jointly by the entire Board and Associate Examiners. After a general consideration of the details of the candidate's oral and pathology examinations, including a review of his capability and general adaptability, the candidate is passed or failed by the entire Board of Directors.

The final action of the Board is based upon the candidate's ethical and professional record, training, and attainments, as well as on the results of his formal examination.

When a candidate fails in Part II of the examination, he is not required to repeat Part I, but is required to repeat Part II only. One reexamination may be taken within three (3) years of the original examination and first failure without formal reapplication papers. Request for reopening of the candidate's original application must be filed with a reexamination fee of $25.00 (see Application and Fees). Application for reexamination in Part II must be made by the candidate prior to September 1 of each year. Data regarding additional training or experience and Medical School or hospital appointments acquired in the interim must be cited in the letter and verified on a Supplemental Training Form obtained from the Office of the Secretary of this Board.

The reexamination fee will be effective only on original applications filed subsequent to the date of this announcement, namely, June 1, 1949. The candidate may be allowed to reappear at the examination following the one failed by him. The Board may, at its discretion, deny the candidate the privilege of reexamination.

Failure to exercise the privilege of reexamination within three (3) years, entails the filing of a new application with the usual application and examination fees.

After two failures in either Part I or Part II on the first application, the candidate may reapply with a new application and reapplication fee of $35.00 and reexamination fee of $100 and be readmitted to examinations once only. Exceptions to this ruling can be made only by action of the entire Board of Directors in annual session, usually to be based upon evidence of additional training and experience sufficient to warrant such action.

GRADUATE TRAINING RESIDENCIES

This Board, through the Council on Medical Education and Hospitals of the American Medical Association, has approved institutions providing the acceptable residencies in obstetrics and gynecology.

The American Board of Obstetrics and Gynecology has established the following requirements for its approval of a residency in a hospital department or service:

1. It is most desirable that the Chief of Service of the Department be certified by the Board, in the interests of the proper teaching of the specialty of obstetrics and gynecology. In lieu of such certification the Board will approve of individuals of recognized high professional standing in the specialty. At least one additional senior member of the staff should be similarly qualified.

2. Exceptions to the foregoing, in respect to the certified status of Chiefs of Service and others as outlined above, can be made by assent of the Committee on residency Training, for adequate and justifiable reasons. As examples of the latter, the degree of F.A.C.S. in obstetrics-gynecology may be accepted in lieu of one of the two required certifications if the general reputation of the person concerned is known to the Committee as national or sectional in scope, or a professorial rank without certification might be acceptable.

3. In instances where the services of obstetrics-gynecology are not combined but are separate in any given hospital, the Chief of each such service seeking approval and at least one of his subordinates must be certified or otherwise qualified as outlined above. If obstetrics and gynecology are not combined in one department, approval can be granted only if arrangements are made for some degree of rotation of residents between both services, provided both services are separately approved.

4. If gynecology is classified in the given hospital as a subdivision or subservice of general surgery, approval cannot be granted for residency training in gynecology. Exceptions have been made if the subdivision of Gynecology is headed and staffed by a Chief and at least one other certified by this Board or otherwise qualified as specialists in obstetrics-gynecology, as specified above, thus ensuring an acceptable educational program in obstetrics-gynecology.

5. Departments holding official approvals for residency training are cautioned that their totals of residents appointed must be kept to the number specified in the A. M. A.—American Board approval notification. Dilution of training facilities by unauthorized appointment of residents in excess of these numbers may be cause for reinspection and changes in approval status of such hospitals and their special services.

6. For further details of requirements and qualifications for approval for residency training, hospital officials should refer to the latest special issues of THE JOURNAL of the A. M. A. as they appear during each year, dealing with these subjects, or should apply to the Council on Medical Education and Hospitals of the A. M. A. for bulletins entitled Essentials of Approved Residencies and Fellowships.

7. Application for residency approval must be made in triplicate on special forms provided for this purpose. These forms may be obtained from the Secretary of the Council on Medical Education and Hospitals of the A. M. A. All statements amplifying an application should also be made in triplicate. The hospital should keep a duplicate of all papers.

8. The formal application, with all papers, for residency training approval should be submitted primarily to the Council on Medical Education and Hospitals of the A. M. A., 535 N. Dearborn St., Chicago 10. Action is taken jointly by the Council and this Board after survey by the Council.

9. Approvals are granted according to adequacy of the training program and teaching facilities of various institutions on the following several bases: (a) one-year approval in obstetrics and gynecology (combined) or one-year approval in obstetrics and/or gynecology (*separate*), correlated basic science instruction being an essential part of the first year; (b) two-year approval in obstetrics and gynecology (combined) or two-year approval in obstetrics and/or in gynecology (separate), provided there is opportunity in the latter instances for some degree of rotation between the two services as well as laboratory instruction in basic sciences; (c) three-year approval in obstetrics and gynecology (combined) or in obstetrics or in gynecology, provided there is opportunity for one to one and one-half years service in the branch of the specialty opposite to that in which the candidate holds appointment, as well as laboratory instruction in the basic sciences of both branches.

Exchange residencies within the specialty between approved institutions are acceptable and to be encouraged. Many authorities believe that training in more than one institution is broadening to the candidate. "Farming out" to unapproved institutions or services is not acceptable unless the work of such services is directly and carefully supervised by the Chiefs of the service in the approved hospital under which the man is actively appointed and working. This should be attested by such Chiefs.

Exchange residencies into other specialties cannot be permitted to subtract from the minimal required three (3) years of training divided between obstetrics-gynecology.

As noted elsewhere in the Bulletin two (2) years of post-training practice limited to the specialty is necessary before a candidate may apply for examination.

This Board has no objection to residency services being arranged by hospitals for periods longer than three (3) years, unless this dilutes the candidate's clinical training opportunities too much during the first three (3) years. However, the Board does not accept a fourth year, or more, of residency training as a substitute for any part of the required two (2) years of post-training practice.

The importance of post-training practice in the specialty is emphasized as an opportunity for maturing of the candidate and for colleague appraisal of a man's ability when working on his own responsibility in his chosen community.

Exception to this ruling may be made for men advancing from their training into and planning to remain in full-time teaching positions. These men then must complete at least two (2) years in such positions. Consequently the only institutions in which men may work as fourth and fifth-year residents and obtain credit for this time as "post-training practice" are those directly affiliated with approved Schools of Medicine as teaching hospitals for undergraduate instruction. These "full-time" men must hold faculty appointments, must have teaching duties with undergraduate students, must be given independent authority more than that of residents, and must make a declaration of intention to remain in full-time teaching work.

10. Any physician formally obligating himself to serve a residency in a Council on Medical Education and Hospitals of the American Medical Association-American Board of Obstetrics and Gynecology approved hospital and thereby eliminating other possible candidates from the position, who breaks his contract without justifiable cause, either before beginning his service or during his period of service, except by mutual consent and agreement between the candidate and the hospital, may be barred from the examinations for certification at the discretion of the Board.

11. It should be recalled by all concerned that credits for graduate training may be obtainable in certain instances for residency or assistantship service in hospitals not officially approved for residency training. Each such case must be individually considered, and credits will be largely dependent upon the teaching qualifications of those in charge of the service and the clinical facilities of the hospital in question.

PRECEPTORSHIP TRAINING

After July 1, 1958, the initiation of Preceptorship Training must be preceded by two (2) years of formal training in an institution approved for Residencies in obstetrics and/or gynecology. Candidates who propose Preceptorship Training must notify the Secretary of the Board of such intent and request an application form. When this has been completed, signed by the Preceptor and Preceptee and returned to the Secretary, it will be submitted (as has long been true of Residency Training Programs) to the Residency Training Committee of the Board for their decision.

If the program is approved the Preceptor must supervise closely the candidate's work and keep an informative record of the candidate's performance. The Preceptor and the Preceptee shall report in writing to the Secretary of the Board at the end of each six months of Preceptorship, outlining the progress of the training program. This information will be placed in the candidate's application for admission to examination in order that it may be evaluated by the Credentials Committee.

As a general rule each year of Preceptor Training will receive a six-month credit toward the total of three years of training necessary for admission to examination. As is the case with candidates whose training has been entirely by formal Residency, each application will be evaluated finally by the Credential's Committee.

An acceptable Preceptor preferably shall be one certified by the American Board of Obstetrics and Gynecology and must have been certified for a minimum of five years. Fellowship in the American College of Surgeons or long experience and established reputation as an obstetrician-gynecologist without either of the above qualifications may qualify the Preceptor. Preceptor and Preceptee must work in a hospital approved by the Joint Commission on Accreditation of Hospitals.

The post-training practice requirement cannot be carried on concurrently with Preceptorship Training.

AMERICAN BOARD OF OPHTHALMOLOGY

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PREREQUISITES

1. High ethical and professional standing.
2. Full citizenship in the country where the candidate practices. (Limited to countries of North and South America, their possessions and territories, and the Philippine Republic.)
3. A degree from a medical school of high standing, satisfactory to the Board and approved by the Council on Medical Education and Hospitals of the American Medical Association.
4. Completion of an internship of not less than one year in a hospital approved by the same Council.
5. Completion, by the time of the Written Qualifying Test, of not less than 36 months (a total of 60 months is required of candidates practicing both ophthalmology and otolaryngology) of combined study, training, and practice of ophthalmology in approved medical schools, hospitals, clinics, dispensaries, laboratories, and private practice.

APPLICABLE TO APPLICANTS WHO START RESIDENCIES IN OPHTHALMOLOGY AFTER DECEMBER 31, 1956

Individuals who have completed three years of formal ophthalmological training (residency and basic science courses) may apply for the written qualifying test after completion of 12 months of practice or 12 months of institutional work, a total of 48 months. All other individuals, with less formal training, may apply for the written test after 60 months in ophthalmology or 72 months of combined ophthalmology and otolaryngology. A basic course is recognized as equivalent in time to residency training. All time requirements must be completed by the date of the written test.

GENERAL REQUIREMENTS FOR ALL CANDIDATES

1. Application forms must be filled out completely and accurately. Letters of endorsement, together with any other required credentials, must be sent to the Secretary's office before the published deadline date.
2. Fee of $100.00 remitted with application.
3. *A list of papers or books published.*
4. Written qualifying test.
5. Practical examination.
6. Special review of ophthalmic surgery. (Instructions on Page 9.)
7. Licensure in the state, province, or country where the candidate practices.

SPECIAL TRAINING

This shall include:

1. Graduate study of the basic medical sciences which are fundamental to the intelligent practice of ophthalmology, particularly: anatomy, histology, embryology, optics, physiologic optics, visual physiology and psychology, pathology, bacteriology, pharmacology, disorders of ocular motility and binocular vision, perimetry, and in the skillful adjustment and use of instruments such as the ophthalmoscope, retinoscope, slit lamp, and microscope. Mere factual knowledge is not sufficient; the candidate must have had training in the application of these subjects and in their use in clinical ophthalmology, especially in refraction.
2. Active clinical experience in approved hospitals, clinics, dispensaries, and private practice. Library and laboratory facilities should be utilized for the intensive study of cases.

These requirements may be met in various ways:

BASIC STUDIES

Anatomy and Histology of the Normal Eye
Embryology and Developmental Abnormalities
Biochemistry
Pathology
Microbiology and Immunology
Optics and Physiological Optics
Ocular Physiology
Medical Ophthalmology
Pharmacology
Neuro-Ophthalmology
Principles of Ophthalmic Surgery

These may be covered by graduate study—by a curricular course in the basic sciences related to Ophthalmology in an approved graduate medical school.

FEES

For original written test, $100.00, payable with application.

For original clinical examination, $50.00 payable on successful completion of the written test.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY

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REQUIREMENTS FOR PART 1 EXAMINATION

1. Citizenship in the United States or Canada, or possession of papers showing intent to become a full citizen.

2. Graduation with a degree of Doctor of Medicine from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association or graduation from a foreign school on the list of institutions surveyed by the aforementioned Council at the time the application is received.

Note: Graduates of foreign medical schools not on the list of the Council who pass the examination of the Educational Committee for Foreign Medical Graduates will be acceptable to the Board on the same basis as others possessing the degree of Doctor of Medicine as herein stated. Send inquiries to the Educational Council for Foreign Medical Graduates, 1710 Orrington Ave., Evanston, Ill. The Board will not accept completion of the examinations of the National Board of Medical Examiners in lieu of the examinations of the Educational Council for Foreign Medical Graduates.

After 1961 the list of approved foreign medical schools will be discontinued by the Council on Medical Education and Hospitals, and every foreign graduate will be required to pass the examination of the Educational Council.

3. Completion of an internship of not less than one year in a hospital approved at that time by the aforementioned Council, or if trained abroad, in institutions considered satisfactory by the American Board of Orthopaedic Surgery.

4. Completion, in addition to the above, of one year of resident training in general surgery in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association.

Note: This minimum year of training in general surgery may also be satisfied in one of the following alternate ways, subject to approval by the American Board of Orthopaedic Surgery, and can be accomplished at any time during the total period of residency training.

(a) A second year of surgical internship.

(b) Time spent in supervised research pertaining to orthopaedic surgery.

(c) Time spent on services which have overlapping interest with orthopaedic surgery.

(d) A fourth year of orthopaedic training, consisting of either 12 months of orthopaedic surgery or 6 months of such surgery and 6 months of fractures and related trauma.

(e) Surgical work in private practice—candidates will present a list of independent surgery prepared by the hospital record librarian and supplemented by letters from at least two colleagues evaluating their experiences.

(f) Surgical work in military service—credit is granted only after termination of military service and presentation of the Professional Training Record and letters from Chiefs of Services.

5. Two of the required three years of resident training in orthopaedic surgery under a program approved by the Residency Review Committee. (See list of approved services in the Internship and Residency Number of the Journal of the American Medical Association.)

FILING OF APPLICATION FOR PART 1 EXAMINATION

1. Application blanks for this examination are obtainable from the office of the Board. They must be returned to the office before November 30 of the year preceding the examination and must be accompanied by the registration fee of $15.00, a nonrefundable fee.

2. The Committee on Eligibility is the sole arbiter in deciding whether the application is acceptable or not. Questions only as to rules and procedures may be answered by the Secretary.

3. Notification of acceptance is mailed to eligible applicants in February of the year of the examination.

4. A fee of $40.00 is payable on receipt of said notification. The fee is not refunded if the candidate fails to appear at the scheduled examination, unless in response to his written request the Committee on Eligibility rules otherwise.

5. An application which has been accepted by the Committee on Eligibility remains valid for three years, after which time a new application and fee are required.

6. The date and place of the scheduled examination are announced in THE JOURNAL of the American Medical Association and also in the Journal of Bone and Joint Surgery. The examination is usually held in April in three cities strategically located in the eastern, central, and western sections of the country.

SCOPE OF PART 1 EXAMINATION

The examination is in two parts—written and oral.

The written part covers such subject matter as: fundamental principles of surgery, elementary fractures and related trauma, orthopaedic surgery, history taking, physical diagnosis and also anatomy, pathology, and physiology and biochemistry, insofar as related to the Specialty.

The oral portion covers the following five subjects: (1) anatomy; (2) pathology; (3) physiology and biochemistry; (4) surgery, and (5) fractures, related trauma and orthopaedic surgery.

RESULTS OF PART 1 EXAMINATION

1. Notification of the results of the part I examination is mailed by the Secretary of the Board to both successful and unsuccessful candidates.

Note: No information respective to the results is obtainable prior to the date of said notification. Furthermore, no certificate is issued to successful candidates of part 1 examination, and no details as to the grading of integral parts of the examination are made available to either applicants or diplomates of the Board.

2. Successful candidates may make application to the Board for admission to the part 2 examination, as explained in Section VII.

3. Unsuccessful applicants may repeat the part 1 examination in each of the two ensuing years, as necessary, and may do so without additional training requirements or the filing of a new application. They are, moreover, automatically reconsidered for examination by the Committee on Eligibility during the additional two years their application remains valid.

4. On receipt of the Committee's approval of his eligibility to repeat the examination, the applicant must pay to the Board the fee of $40.00.

5. After the third and subsequent failures to pass the part 1 examination, the Committee on Eligibility may require the unsuccessful candidate to obtain the equivalent experience of one year of residency training acceptable to the Committee. A new application with a fee of $15.00 must then be submitted for each additional examination, and this must, in turn, be followed by payment to the Board of the fee of $40.00 on receipt of notification from the Committee.

REQUIREMENTS FOR PART 2 EXAMINATION

Note: Successful completion of the part 1 examination does not automatically enjoin the Board to declare the candidate eligible for the part 2 examination. Certain additional requirements as well as the approval of the Committee on Eligibility are requisite.

1. Part 2 examination must be taken within the five-year period following completion of the part 1 examination. After this lapse of time it will be necessary to take the part 1 examination over again before eligibility for the part 2 examination can be considered. In some cases the Committee on Eligibility may extend this time beyond five years because of problems presented by service in the military forces.

2. The FORMAL REQUIREMENTS leading to either "full" or "limited"* Certification by the Board are as follows:

(a) Full citizenship in the United States or Canada.

(b) License to practice medicine in the United States or Canada.

(c) High ethical and professional standards and satisfactory moral standing in the community.

3. TRAINING REQUIREMENTS.—The requirements for "Full Certification" (including the training completed prior to part 1 examination) are as follows:

(a) One year of general surgery or its equivalent.

(b) One year of adult orthopaedic surgery.

(c) Six months of fractures and related trauma.

(d) Six months of basic science training.

(e) One year of children's orthopaedic surgery.

Note: The training requirements for "Limited Certification" are identical with those for "full certification" except for the one year devoted to children's orthopaedic surgery. In its stead there is in addition to the above requirements—items 3a through 3d—a choice between the following two alternatives:

(a) Twelve months of training in adult orthopaedic surgery, or

(b) Six months of training in adult orthopaedic surgery and six months in fractures and related trauma.

PRACTICE REQUIREMENTS

These are:

(a) All practice requirements must be satisfied after completion of the formal training requirements.

(b) Practice must be limited to orthopaedic surgery for two years, except as other therapy may be required in the care of patients on emergency services.

(c) Candidates in private practice must spend 14 of the 24 months immediately prior to application for the part 2 examination in one locality to permit the Committee on Eligibility to evaluate the candidate's competence in practice.

(d) A candidate employed full time in institutions may satisfy practice requirements by serving a minimum of two years. The minimum requirement of two years of practice limited to orthopaedic surgery cannot be satisfied by mixing full time institutional work with preceding or subsequent time in private practice unless the Committee on Eligibility rules otherwise.

FILING OF APPLICATION FOR PART 2 EXAMINATION

1. Applications for admission to the part 2 examination must be received in the office of the Secretary of the American Board of Orthopaedic Surgery before August 15 of the year preceding the examination. Each application must be accompanied by payment of the nonrefundable fee of $15.00.

2. An application remains valid for three years, after which time a new application and fee must be submitted.

3. On notification from the Committee on Eligibility of approval of the candidate's application, a fee of $75.00 must be paid to the Board. The notification is mailed out by the Secretary during the month of November preceding the part 2 examination.

4. Failure to appear for the scheduled examination entails forfeiture of the fee unless upon written request from the candidate the Committee rules otherwise.

SCOPE OF PART 2 EXAMINATION

1. The examination consists of two parts—written and oral.

2. The written part covers advanced work in all phases of orthopaedic surgery and trauma related to the muscular skeletal system in which the candidate has been trained.

3. The oral portion covers the following five items: (1) anatomy; (2) pathology; (3) children's orthopaedic surgery; (4) fractures and related trauma, and (5) adult orthopaedic surgery.

Note: Candidates for "limited certification" will not be examined in children's orthopaedic surgery, but will be tested personally in adult orthopaedic surgery and fractures and related trauma by two different groups of examiners.

RESULTS OF PART 2 EXAMINATION

A.—*Successful Candidates*

1. Candidates who have successfully passed the part 2 examination and who are otherwise acceptable to the Board on the basis of full requirements, receive appropriately a "full" or a "limited" certificate, stating that they have been found qualified to practice the Specialty of Orthopaedic Surgery in those fields in which they have been trained and examined.

2. Candidates who obtain "limited certification" are expected to delete children's orthopaedic surgery from their practice because of lack of approved training. They may subsequently become fully certified by completing one year of approved resident training in children's orthopaedic surgery and passing the Board examination in that field. A practice period of one year should intervene between the completion of the additional training and the examination. The examination fee is $25.00.

B.—*Unsuccessful Candidates*

1. Candidates unsuccessful in the part 2 examination are so informed by the Secretary. The grades received on integral parts of the examination are not revealed either to the candidate or to diplomates of the Board.

2. Candidates who fail one oral examination or the written examination will be required to repeat this portion of the examination within three years upon payment of a fee of $25.00.

3. Candidates who fail two oral interviews or one oral and the written test must repeat the entire examination as described in paragraph four.

4. The examination may be repeated on two subsequent occasions without requirement for further training or the filing of a new application. The eligibility of the candidate for reexamination receives automatic consideration from the Committee, and the results will be made known to him. On notification of his approval by the Committee on Eligibility, payment of the fee of $75.00 must be made to the Board.

5. After a third or subsequent failures to pass part 2 examination; the candidate may apply to the Committee on Eligibility for permission to repeat the examination. The Committee may require the candidate to gain additional experience equivalent to one year of resident training. A new application and fee of $15.00 must be submitted for each additional examination and this must be followed by payment to the Board of the fee of $75.00 on receipt of Committee approval of the candidate's eligibility.

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*Training leading to Limited Certification will be discontinued after Jan. 1, 1962.

MILITARY SERVICE

1. Medical officers who have elected service in the military forces as their life career compete for certification on the same basis as do doctors in civilian practice; that is, they must satisfy the practice requirements by military assignments in which their duties are limited to the practice of orthopaedic surgery.

2. Medical officers on temporary or permanent status with the armed services who serve in military hospitals approved by the Residency Review Committee, obtain credit on the same basis as do residents on approved services in civilian hospitals.

3. Applicants who serve in military hospitals not approved by the Council for resident orthopaedic training, but whose experience is judged by the Board to have been equal to that obtained on the approved orthopaedic programs, may be granted the maximum credit of one year of resident orthopaedic training.

4. Applicants requesting such credit must submit completed "Professional Training Records" in addition to lists of operations performed by them, and letters from Chiefs of Services with evaluations of their experience.

5. Medical officers assigned to residency programs in civilian institutions on the approved list for orthopaedic training receive the same credit as do civilian candidates.

RECORDS OF SURGICAL CASES AND INSPECTIONS

1. Records of a specified number of consecutive surgical cases may be requested by the Board in order to evaluate properly the work of an applicant.

2. A representative of the Board may visit a community in order to evaluate properly the work of an applicant.

APPROVED RESIDENCIES

1. Training in the United States must be taken in institutions approved for resident training in orthopaedic surgery by the Residency Review Committee. The latter is made up of representatives of the Council on Medical Education and Hospitals of the American Medical Association and the *American Board of Orthopaedic Surgery.*

A complete list of approved institutions is published annually in the Internship and Residency Number of The Journal of the American Medical Association. The list is not obtainable from the office of the Board.

2. The integral parts of approved residencies are designated in the list by the following symbols: A—Adult Orthopaedic Surgery; C—Children's Orthopaedic Surgery; F—Fracture Surgery and related Trauma. Training in the basic sciences is given either as an integral part of these services or as a separate course. The length of training in various approved institutions is also indicated.

3. Candidates electing an additional year of training in adult orthopaedic surgery and surgery of fractures and related trauma in lieu of a year of children's orthopaedic surgery for the "limited certificate" may satisfy requirements by continuing their training in institutions approved for adult orthopaedic surgery, or adult orthopaedic surgery and fractures and related trauma.

4. Credit for time spent in institutional resident training will be granted only for the period the institutions are on the approved list. Credit may be given from the start of the resident training period if the institution becomes approved during the time the candidate is in training and the program is found to be satisfactory.

5. Candidates engaged in resident training in institutions which become disapproved in whole or in part receive resident training credit for the entire period during which their contracts are in force.

6. The term "fellow" is considered synonymous with "resident" only if the position occupied and the work performed by the former are in all respects equal to those of the latter. The total number of residents and fellows performing resident training for credit must not exceed the number approved by the Residency Review Committee for a given program.

7. Institutions approved for resident training in orthopaedic surgery by the Residency Review Committee may utilize the training facilities of institutions not individually approved for resident training by the aforementioned Committee, provided that:

(a) The resident spends at least half of the minimum time required in each category of training in institutions approved for that type of training by the Council.

(b) The training supplements services in the same categories in which the institutions responsible for the training is approved.

(c) Whenever the supplemental service is used for six months of training, the program is inspected and is subject to approval by the Residency Review Committee.

Note: Services thus approved may request that they be included under the appropriate training program in the official list of residencies of the Council on Medical Education and Hospitals of the American Medical Association. Services giving five months or less of training are subject to approval but not necessarily inspection by the Residency Review Committee; they are not included in the official list of residencies of the Council.

(d) A maximum of three months is spent on services devoted to rehabilitation.

REQUIREMENTS OF INSTITUTIONS OFFERING ORTHOPAEDIC TRAINING

1. Institutions approved for full three-year programs and including all parts of the training requirements may integrate all parts so that they may be given concurrently.

2. Institutions now approved for less than three years of resident orthopaedic training must make cooperative arrangements with other approved institutions so as to provide complete three-year programs for all of the residents by January, 1962.

3. The minimum requirements of resident orthopaedic training programs are as follows:

(a) One year of training in adult orthopaedic surgery.

(b) Six months of training in the basic sciences.

(c) Six months of training in fractures and related trauma.

(d) One year of training in children's orthopaedic surgery if "Full Certification" is the aim, or else a second year of adult orthopaedic training in surgery, fractures, and related trauma if "limited certification" is elected.

(To be discontinued after January 1, 1962.)

4. Candidates who take an additional year of training in adult orthopaedic surgery and fracture surgery in place of a year of children's orthopaedic surgery may satisfy the requirements by devoting the additional year either solely to training in adult orthopaedic surgery or by taking six months of adult orthopaedic surgery and six months of fractures and related trauma. But the entire year must not be devoted solely to training in fractures and related trauma.

5. Training in adult and chidlren's orthopaedic surgery must include observation and first-hand experience in diagnosis, treatment, and operative and postoperative care of orthopaedic problems.

6. Training in fracture surgery and related trauma must similarly include observation and first-hand experience in diagnosis, conservative and operative treatment, and postoperative care of recent and old fractures as well as other forms of related trauma.

7. Training in the basic sciences must instill a sound knowledge of anatomy, pathology, physiology, bacteriology and biochemistry, insofar as these relate to orthopaedic surgery.

8. Candidates may complete the residency requirements by training in several approved institutions, provided that all of the aforementioned requirements are satisfied.

9. No training period of less than six consecutive months in one institution may be credited toward resident training requirements, except as noted in Section XIV-7c.

10. Candidates in resident training may not engage in private practice of their own or receive credit for time spent in private office practice of others.

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GENERAL REQUIREMENTS

The following general qualifications of candidates for examination are required by the board:

1. A candidate must have been a graduate for five years or more of a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association.

2. A candidate must be of known good moral character and be ethical in his professional relationships.

3. A candidate trained in a foreign country must be able to give proof of medical and graduate training comparable to the requirements of the board.

4. A candidate from the United States or the Dominion of Canada must be a member of the American Medical Association or of the Canadian Medical Association respectively or other such medical societies of equal standing as are recognized by the Council on Medical Education and Hospitals of the American Medical Association.

5. Candidates from foreign countries who have received their training in otolaryngology in the United States and the Dominion of Canada are eligible for examination at the discretion of the American Board of Otolaryngology, provided they meet the general academic requirements of the Board.

SPECIAL REQUIREMENTS

1. A candidate must have had a general internship of at least one year in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association.

2. A candidate must be proficient in the applied basic sciences, fundamental to the intelligent practice of otolaryngology. These include anatomy of the ear, nose, and throat, neck, chest, esophagus and nervous system, gross pathology and histopathology, bacteriology, physiology, didactic otolaryngology and the general fundamentals of surgery. (This requirement may be fulfilled in a residency or fellowship service or in an approved organized post-graduate course.)

3. In addition to the general internship, the required clinical training in otolaryngology may have been acquired in any of the following ways:

(a) A three years' residency or fellowship in otolaryngology approved by the Council on Medical Education and Hospitals of the American Medical Association.

(b) A four years' approved residency or fellowship in otolaryngology and ophthalmology provided one half of the training has been in otolaryngology.

(c) A two years' approved residency or fellowship in otolaryngology or a three years' approved combined residency or fellowship in otolaryngology and ophthalmology, provided two years have been in otolaryngology and have been preceded by at least one year's approved residency training in surgery or medicine, or by an additional year in an approved internship.*

4. In exceptional circumstances certain candidates who do not meet all of the above requirements may be accepted for examination on recommendation of the credentials committee, substantiated by action of the board.

5. At least one year must be spent in private, group, or institutional practice of otolaryngology after the period of special training. This requirement may be waived in cases of candidates from foreign countries who are returning there for the practice of otolaryngology. Should such a candidate pass the examination the certificate of the board will be withheld until the board has been furnished evidence that the candidate has spent one year in the practice of otolaryngology. (When the requirement of an additional year referred to in No. 5 may impose handicaps as to rating, in the Military or Veterans Administration Services, the candidate may be considered under No. 4 above.)

6. A candidate may be qualified for examination, at the discretion of the American Board of Otolaryngology, if an addition to the General Requirements and Special Requirements, No. 1 and 2, he has limited his practice to otolaryngology for seven years in association with a hospital staff approved by the Council on Medical Education and Hospitals of the American Medical Association.

7. A physician who limits himself exclusively to the practice of peroral endoscopy may be granted limited certification in this field by the American Board of Otolaryngology irrespective of certification in any other specialty. Limited certification will be granted provided the candidate has spent not less than one year of training in a hospital approved for endoscopic teaching and has passed successfully examinations in the basic sciences as they pertain to this field, and didactic and clinical examinations covering diseases of the larynx, pharynx, neck, esophagus, stomach, tracheobronchial tree, lungs and mediastinum and certain aspects of cardiovascular disease as they pertain to peroral endoscopy. A limited certificate by the American Board of Otolaryngology will not be issued to physicians who have been certified in a specialty that employs peroral endoscopy in diagnosis and/or treatment because his major interest is in that specialty, not in endoscopy.

All candidates must comply with current board regulations, regardless of the time of filing application.

APPLICATION AND FEES

1. Application must be made in duplicate on special blanks procured from the secretary. The completed application blanks must be returned to the secretary, together with the other required credentials, at least 120 days in advance of the examination at which the candidate desires to appear.

2. The applications must be accompanied by two small photographs of the candidate, together with verification of the period of enrollment from the institutions where training in otolaryngology was obtained, and the names of two or more

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*See Standards for Residencies in Otolaryngology published by the American Medical Association.

otolaryngologists, preferably diplomats of the board, from the vicinity of the candidate's place of residency, to be used as references.

3. The fee for the examination is $150. Of this sum $75 must accompany the application, of which $50 shall be returned if candidate is not accepted for examination. No application will be acted on until the $75 application fee is received. The remaining $75 of the total examination fee of $150 must be paid to the secretary on notification that the candidate has been accepted.

4. The fees have been carefully computed on a basis of cost of examinations and are used entirely for administrative expenses. Examiners serve without compensation other than actual expense.

5. The application remains valid for three years. An applicant must appear for examination within this time or forfeit the fee.

6. Candidates whose credentials have been found satisfactory and who meet the requirements of the board will be notified 90 days prior to the date of examination. The number of candidates who can be admitted to any one examination is limited. Due to a large number of applications on file, delay in assignment for examination may be inevitable. Appointments will be given in the order applications are accepted and on payment of the balance of the examination fee.

7. The board, acting as a committee of the whole, reserves the right to reject an applicant for any reason deemed advisable and without stating the same, and the action of the board shall be final.

EXAMINATION

Examinations will be held at such time and place as the judgment of the board may dictate. Advance notice of examinations will be given in The Journal of the American Medical Association and the several special journals devoted to otolaryngology. Insofar as is possible these will be held biannually at, or near, the time and place of meeting of the American Medical Association, or special societies, and of the American Academy of Ophthalmology and Otolaryngology. The examinations cover from two to four days.

Scope.—This examination encompasses all phases of otolaryngology and peroral endoscopy, including maxillofacial surgery, and surgery of the neck, excluding the thyroid.

The type of examination is as follows:

1. Clinical, covering the actual handling of patients, including history-taking, physical and functional examinations, the use of laboratory and x-ray findings, and a discussion of differential diagnosis.
2. Didactic, oral examinations covering all phases of otolaryngology.
3. Gross and microscopic pathology.
4. A written examination may be included when the board deems this advisable.

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GENERAL REQUIREMENTS

1. Satisfactory moral and ethical standing in the profession.
2. License to practice medicine or a certificate of the National Board of Medical Examiners.
3. The applicant must devote his time primarily and principally to the practice of pathology.

PROFESSIONAL EDUCATION

1. Graduation from a medical school in the United States approved by the Council on Medical Education and Hospitals of the American Medical Association, or graduation from medical schools in other countries acceptable to the board.

SPECIAL TRAINING AND EXPERIENCE

1. The board admits candidates to examinations who are otherwise eligible and who have had either of two following types of training and experience.

(a) After five years, if four of the five years have been in institutions approved by the Council on Medical Education and Hospitals of the American Medical Association or by the board; or

(b) After 11 years if none of the training and experience has been in institutions so approved.

2. The specific requirements for those acceptable after five years are as follows:

(a) Pathology anatomy only.

(1) Four years of supervised study and training in an institution approved for residency training in pathological anatomy by the Council on Medical Education and Hospitals of the American Medical Association or by the board. It is immaterial whether the candidate holds the title of resident or fellow or assistant. Candidates may, at their own election, substitute not to exceed 12 months of a straight or rotating clinical internship or a fellowship or instructorship in any of the preclinical departments of a university for one of the four years. In addition, time, not to exceed 12 months, spent in a department of pathology of an approved school of medicine after the completion of the second year of undergradute study may be counted for full credit toward the four years.

(2) One additional year, which may be a continuation of the preceding or may be independent practice of pathological anatomy in a hospital approved by the American Medical Association or other institutions acceptable to the board.

(b) Clinical pathology only.

(1) Four years of supervised study and training in an institution approved for residency training in clinical pathology by the Council on Medical Education and Hospitals of the American Medical Association or by the board. It is immaterial whether the candidate holds the title of resident or of fellow or assisant. Candidates may, at their own election, substitute not to exceed 12 months of a straight or rotating clinical internship or a fellowship or instructorship, in any of the preclinical departments of a university, for one of the four years. Candidates holding also a master's or doctor's degree in a special field of clinical pathology (bacteriology, serology, chemistry, parasitology, or hematology) may obtain time credit for not more than 12 to 24 months toward the four years for this work, regardless of whether it was taken before or after the medical degree. The evaluation of time credit will depend on how much of the broad field of clinical pathology was covered in the graduate work.

(2) One additional year, which may be a continuation of the preceding or may be independent practice of clinical pathology in a hospital approved by the American Medical Association or other institutions acceptable to the board.

(c) Pathological anatomy and clinical pathology.

(1) Four years of supervised study and training divided as follows: (a) two years of supervised study and training in pathological anatomy as outlined in the preceding para-

graph 2-(a)-(1), (b) two years of supervised study and training in clinical pathology as outlined in the preceding paragraph 2-(b)-(1). Candidates declared eligible before July 1, 1953, may, at their own election, substitute one year (twelve months) of a straight or rotating clinical internship for one year of this special training in clinical pathology. After July 1, 1953, all candidates applying for both pathological anatomy and clinical pathology will be required to have two years of supervised training in clinical pathology.

(2) One additional year, which may be a continuation of the preceding or may be independent practice of both pathological anatomy and clinical pathology in a hospital approved by the American Medical Association or other institutions acceptable to the board. After July 1, 1953, candidates who elect to claim credit for one year for a clinical internship must take this fifth year as supervised study and training in clinical pathology in institutions approved for residency training in clinical pathology by the Council on Medical Education and Hospitals of the American Medical Association or by the board. Candidates declared eligible after July 1, 1953, who do not take a clinical internship, may after four years of training as outlined in 2-(1)-(a) and (b), spend the fifth year in independent practice in an institution or laboratory acceptable to the board.

Note: As outlined in the preceding paragraphs, the total time requirements of the board are unchanged after July 1, 1953, namely, five years of study or practice after graduation from medical school, with exceptions noted in sections 2-(a)-(1) and 2-(b)-(1).

3. The specific requirements for those acceptable after 11 years are as follows: (a) The practice of pathology under circumstances acceptable to the board for a period of not less than 11 years. At the election of the candidates, a period not to exceed one year of straight or rotating clinical internship may be substituted for one of the 11 years. For those candidates in this category who have had some special study and training in pathologic anatomy or clinical pathology acceptable supervised study and training, only seven years of practice are required.

CREDIT FOR MILITARY SERVICES

Credit may be allowed for training and experience in pathology in the federal services during the period July 1, 1940, to June 30, 1947. This credit for training or experience or both is given on an individual basis and will depend on the opportunity the applicant has had, as indicated by his or her medical service record in the specialty of pathology.

After July 1, 1947, credit for those military services will be given on the same basis as it is in civilian institutions, except that the rule in the preceding paragraph will not apply to reserve officers who continue on active duty or are called to active duty after that date.

SPECIAL FIELDS OF PATHOLOGY, CLINICAL CHEMISTRY, CLINICAL MICROBIOLOGY, HEMATOLOGY, AND NEUROPATHOLOGY

(IN FORCE AFTER JULY 1, 1954)

The trustees of the American Board of Pathology have adopted the following requirements for certification in special fields of pathology, effective July 1, 1954.

Candidates who have met all general requirements and have had special training and experience that is acceptable to the board in a special field of pathological anatomy or clinical pathology may apply to the board for certification in that special field. The board, at its discretion, may approve this application, and, after the candidate has successfully passed a prescribed examination or has fulfilled certain special qualifications (see below, section D), will issue a certificate designating the special field.

A. General Qualifications:

1. Satisfactory moral and ethical standing in the profession.

2. License to practice medicine or a certificate of the National Board of Medical Examiners.

3. The applicant must devote his time primarily and principally to the practice of pathology or the special field of pathology in which he is requesting certification.

B. Professional Education:

1. Graduation from a medical school in the United States approved by the Council on Medical Education and Hospitals of the American Medical Association or graduation from a medical school in other countries acceptable to the board.

C. Special Training and Experience:

The Board admits candidates to examination in special fields of pathology who are otherwise eligible and who have had either of the following types of training.

1. Applicants already holding a certificate of the board in clinical pathology or the combined certificate in pathological anatomy and clinical pathology (for qualification in clinical chemistry, clinical microbiology, and hematology), or in pathological anatomy (for qualification in neuropathology) —two additional years of supervised training in the special field of their choice in institutions approved by the Council on Medical Education and Hospitals of the American Medical Association or by the board.

2. Applicants not holding a certificate in pathological anatomy or clinical pathology—five years of training in the special field of their choice, provided four of the five years have been in institutions approved by the Council on Medical Education and Hospitals of the American Medical Association or by the board. Candidates may, at their own election, substitute not to exceed 12 months of a straight or rotating clinical internship or a fellowship or instructorship in any of the preclinical departments of a university for one of the four years. The fifth year may be a continuation of supervised training or may be independent practice of the particular specialty in a hospital approved by the American Medical Association or in other institutions acceptable to the board.

D. Special Qualifications—Certification Without Examination:

Prior to Jan. 1, 1960, the board at its discretion may certify candidates without examination if the following conditions have been met as of Jan. 1, 1955:

1. That the candidate has been for a period of five years of professorial rank in the special field of his choice and in an approved medical school, or

2. That the candidate has been practicing his specialty for 10 years in a senior position in a hospital having an adequate department in the special field, approved by the Council on Medical Education and Hospitals of the American Medical Association, or in an institution acceptable to the board.

APPLICATION BLANK AND FEE

Application must be made on the special form that may be procured from the secretary and forwarded with other required credentials and the application fee. An application cannot be given consideration by the board unless it is accompanied by the application fee.

The application or examination fee for candidates is $100. If the candidate fails in his examination he will be admitted to a second examination after one year. The applicant must pay an additional fee of $50 before a second examination will be given.

The application fee of $100 has been determined after careful consideration and is based on actual estimates of the expense of examination and administration. None of the board members receives any compensation for his services except actual expenses incurred.

If the applicant, for any reason, is deemed ineligible for examination by the board, his fee will be returned; however, the application fee is not returnable after the candidate has officially been accepted for examination and notified to report for the examination.

EXAMINATIONS

Written and oral examinations will be held at the discretion of the board at or near the time and place of national medical meetings. If a number of applications from any region of the country are received, an examination in conjunction with a national medical meeting in that section will be arranged so that the financial outlay of the applicant in meeting the examiners will be as small as possible.

The examinations are to be based on the broad principles of pathology with emphasis on diagnosis, interpretation, and technique. The applicant may apply for certification in either pathological anatomy or clinical pathology or both.

The examinations in pathological anatomy consist of a written test, an oral examination on gross pathology, and a practical examination in microscopic pathology. The examination in clinical pathology consists of a written test and an oral and practical examination in the six phases of clinical pathology: bacteriology, hematology, clinical chemistry, parasitology, serology, and clinical microscopy.

DEFINITIONS

1. Pathological anatomy is that branch of pathology that deals with the morphological aspects of disease, recognition being given that that definition covers two phases of pathology: (a) the applied phase with special attention to the description and diagnosis of gross and microscopic specimens, (b) the academic phases of teaching and general morphological diagnosis.

2. Clinical pathology is that branch of pathology that deals with bacteriology, immunology, clinical chemistry, parasitology, hematology, endocrinology, clinical microscopy, and the application of the physical and biological sciences to the diagnosis, prognosis, and treatment of disease.

CRITERIA FOR APPROVAL OF INSTITUTIONS FOR TRAINING IN PATHOLOGY

In Sections C-2-a, C-2-b, and C-2-c of the General Requirements, it is stated that candidates must have certain periods of supervised study and training. The American Board of Pathology, in cooperation with the Council on Medical Education and Hospitals of the American Medical Association, certifies hospitals in the United States as satisfactory for this supervised study and training. Lists of these hospitals are published in the Internship and Residency Number of THE JOURNAL of the American Medical Association each year. In addition, the American Board of Pathology recognizes certain hospitals outside the United States and certain laboratories not connected with hospitals in the United States. Inquiries concerning these should be directed to the secretary of the board.

The general criteria for approval of hospitals and laboratories are both qualitative and quantitative. On the score of quality, consideration is given to the qualifications of the director of laboratories and in the associates and assistants, the supervision of work of the person in training, the excellence of the educational program, and the exactness and completeness of the laboratory work performed. On the score of quantity, consideration is given to the volume and distribution of laboratory work, both in absolute numbers and in relation to the size of the hospital, to the diversity and completeness of test performed, to the size and equipment of the laboratory, and to the number of professional and nonprofessional personnel in relation to the volume of work.

In general, the qualitative standards will determine whether or not a hospital or laboratory is approved and the quantitative standards will determine whether the approval is for one, two, three, or four years of credit toward the requirements of the board.

In evaluation of applications the board takes into consideration the following criteria:

1. Director of laboratories or pathologist:

(a) It is required that the responsible head of the laboratory hold the certificate of the American Board of Pathology in the subject for which the hospital is approved, or be eligible for certification, and that he or she spend full time in the hospital. Full time is not interpreted in terms of hours, but rather that the director have no obligation outside the one approved hospital except in a university department of pathology in which he and the residents have an opportunity to participate in the educational program;

(b) In special instances, the equivalent of full time by two or more qualified persons will be accepted, and one person need not spend the entire working day in the laboratory;

(c) In special instances, two or more hospitals will be approved as a unit with a single full-time director of laboratories, if it is apparent that a satisfactory training program can be conducted;

(d) In hospitals with over 350 beds, it is expected that the professional staff, in addition to the pathologist, will include one or more persons with special training and qualifications in the subspecialties of clinical pathology.

2. Technicians:

There are no absolute criteria, but it is expected that the number of technicians will be proportional to the volume of laboratory work and that, [illegible] the technicians will hold the certificate of the Registry of Medical Technologists of the American Society of Clinical Pathologists.

3. Floor space of laboratory:

In general, it is believed that the size of the laboratory should be related to the size of the hospital and the volume of laboratory work. A minimal ratio is 4 sq. ft. of space in the laboratory, including morgue and autopsy room, for each bed in the hospital.

4. Equipment for the laboratory:

The variety and completeness of laboratory tests performed depend on the size of the hospital. In all hospitals there should be facilities for the more common tests in clinical pathology, for study of surgical specimens, and for performance of autopsies. In larger hospitals, the variety of tests performed should be larger, and in hospitals with over 500 beds all recognized laboratory procedures should be available for study and treatment of the patients.

5. Autopsy percentage:

No institution with a percentage of less than 15 will be approved, and those institutions with percentages between 15 and 40 will be given special scrutiny.

6. Examination of surgical specimens:

All surgical specimens should be sent to the laboratory for gross examination, and microscopic examinations should be made unless there are general or special reasons not to do so.

7. Indices:

There should be indices according to the names of the patients and the diagnoses of all surgical and autopsy material. Indices of clinical pathology are left to the discretion of the hospital.

8. Museum:

There should be available fixed anatomic and pathological specimens for study by the staff in proportion to the size of the hospital. Properly filed and indexed color photographs may in part be substituted for museum specimens.

9. Library:

A reasonably complete library of modern books and recent unbound and bound journals should be available to the hospital, and the more commonly used books and journals should be on hand in the laboratory.

10. Education program:

The work of the person in training should be supervised. Conferences, seminars, journal clubs, and demonstrations should be conducted as frequently as the volume of material and the size of the staff justifies. A clinicopathological conference must be held at least every two weeks.

11. Volume of laboratory work:

(a) As indicated in the following categories, no hospitals with less than 75 autopsies, 1,000 surgical specimens, and 25,000 tests in clinical pathology annually will be approved (Category D), except as outlined in the following paragraphs. It is the belief of the board that less material than this is inadequate for the training of a pathologist.

(b) In the field of clinical pathology, there should be a reasonable diversification of tests, and in each category there should be sufficient absolute volume to provide training and experience. There are no absolute criteria, but special scrutiny will be given to a hospital in which there is not a reasonable diversification and variety.

(c) In the field of pathological anatomy, a deficiency in either autopsies or surgical specimens may be made up by an excess of the other, if the deficiency does not exceed 20% of the minimum required in the ratio of one autopsy to 75 surgical specimens. Thus, in a hospital approved for one year in pathological anatomy and clinical pathology, the minimums are 75 autopsies and 1,000 surgical specimens. If a hospital has 2,500 surgical specimens, it is acceptable if there are only 60 autopsies.

If a hospital has met these minimal qualitative and quantitative standards, it will then, on the basis of the following quantitative standards, be approved for one, two, three, or four years of training in pathological anatomy, or clinical pathology, or both, or some special field as shown for the number of residents indicated.

Category A. In both pathological anatomy and clinical pathology for four years (as required of all candidates seeking certification in both fields who are examined after July 1, 1952).

Minimum: 150 autopsies, 1,750 surgical specimens, and 65,000 tests in clinical pathology for four residents. Additional resident for each 50 autopsies or 500 surgical specimens or 20,000 tests in clinical pathology.

Category B. In both pathological anatomy and clinical pathology for three years. This meets all requirements of the board for supervised training until July 1, 1952. Candidates examined after that date who seek certification in both subjects must take an additional year of supervised training in clinical pathology or pathological anatomy in another hospital that is approved for the deficiency of training required.

Minimum: 125 autopsies, 1,500 surgical specimens, and 50,000 tests in clinical pathology for three residents. Additional resident for each: 50 autopsies, 500 surgical specimens, or 20,000 tests in clinical pathology.

Category C. In both pathological anatomy and clinical pathology for two years. Candidates taking two years in these institutions must have an additional year (two years after July 1, 1952) in an institution in category A, B, or D.

Minimum: 100 autopsies, 1,250 surgical specimens, and 40,000 tests in clinical pathology for two residents. Additional resident for each 50 autopsies, or 500 surgical specimens or 20,000 tests in clinical pathology.

Category D. In both pathological anatomy and clinical pathology for one year. Candidates taking training in these institutions must have an additional two years (three years after July 1, 1952) in institutions that are approved for the deficiency of training required.

Minimum: 75 autopsies, 1,000 surgical specimens, and 25,000 tests in clinical pathology for one resident. Additional resident for each 50 autopsies, or 500 surgical specimens, or 20,000 tests in clinical pathology.

Category E. In pathological anatomy only, for three or more years. Candidates taking all training in these institutions will not be eligible for certification in clinical pathology unless an additional year (two years after July 1, 1952) is taken in clinical pathology in institutions that are approved for the deficience of training required.

Minimum: 175 autopsies and 1,500 surgical specimens for three residents. Additional resident for each 50 autopsies or 500 surgical specimens.

Category F. In pathological anatomy only, for two years. Candidates taking training in these institutions will not be eligible for certification in clinical pathology unless they take one additional year full time in clinical pathology (two years after July 1, 1952) in institutions that are approved for the deficiency of training required, and will be eligible in pathological anatomy only if another year is taken in another institution that is approved for one or more years in pathological anatomy.

Minimum: 125 autopsies and 1,250 surgical specimens for two residents. Additional resident for each 50 autopsies or 500 surgical specimens.

Category G. In pathological anatomy only, for one year. Candidates training in these institutions will not be eligible in both pathological anatomy and clinical pathology unless they take an additional year in pathological anatomy and an additional year (two years after July 1, 1952) in institutions that are approved for these periods of training. Candidates seeking certification in pathological anatomy only must study an additional two years in institutions that are approved for that period of training.

Minimum: 75 autopsies and 1,000 surgical specimens for one resident. Additional resident for each 50 autopsies or 500 surgical specimens.

Category H. For postmortem part of pathological anatomy for two years. Credit is never allowed for more than two years. Candidates taking training in these institutions may pursue further training as follows: 1. For pathological anatomy only. An additional year in an institution in Category A, B, C, E, F, or G with assignment to surgical pathology principally. 2. For pathological anatomy and clinical pathology. An additional year (two years after July 1, 1952) in an institution in Category A, B, C, L, M, or N with assignment to clinical pathology and one-half year assigned to surgical pathology principally, in an institution in Category A, B, C, or J.

Minimum: 125 autopsies for two residents. An additional resident for each 60 autopsies.

Category I. For postmortem part of pathological anatomy for one year. Candidates taking training in these institutions may pursue further training as follows: 1. For pathological anatomy only. An additional two years in an institution in Category A, B, C, E, F, or G with general assignments. 2. For pathological anatomy and clinical pathology. An additional year (two years after July 1, 1952) in an institution in Category A, B, C, L, M, or N with assignment to clinical pathology; and one year to an institution in Category A, B, C, E, F, or G.

Minimum: 75 autopsies for one resident.

Category J. Surgical pathology part of pathological anatomy for one year. Credit is never allowed for more than one year, and the director of the laboratory must hold the certificate of the American Board of Pathology in pathological anatomy or be eligible for certification. Candidates training in these institutions may pursue further training as follows: (1) For Pathological Anatomy only. An additional two years in an institution in Category H or in an institution in Category A, B, or C with assignment to postmortem pathology only. (2) For Pathological Anatomy and Clinical Pathology an additional year (two years after July 1, 1952) in an institution in Category A, B, C, L, M, or N with assignment to clinical pathology full time, and an additional year to an institution in Category A, B, D, E, F, G, or H with assignment to postmortem pathology full time.

Minimum: 2,000 surgical specimens for one resident. An additional resident for each 1,000 surgical specimens.

Category K. Special pathology as part of pathological anatomy. Credit for not to exceed one-fourth the time credit (one year if seeking certification in pathological anatomy only, six months if seeking both pathological anatomy and clinical pathology) of candidates applying in pathological anatomy may be taken in special laboratories with limited activities such as neuropathology, orthopedic pathology, ophthalmic pathology, etc. The candidate who receives credit in this category may, on request, have the field of special pathology designated on the certificate of the board.

Category L. Clinical pathology for three or more years. Candidates taking three years of training in these institutions will not be eligible for pathological anatomy unless they take an additional two years in institutions approved for pathological anatomy.

Minimum: 100,000 tests in clinical pathology for three residents. Additional resident for each 50,000 tests.

Category M. Clinical pathology for two years. Candidates taking two years training in these institutions must take the same additional training as in Category L to be eligible for pathological anatomy also. To be eligible for clinical pathology only, an additional year of clinical pathology must be taken in an approved institution.

Minimum: 75,000 tests in clinical pathology for two residents. An additional resident for each 50,000 tests.

Category N. Clinical pathology for one year. Candidates taking training in those institutions must take an additional two years in an institution in Category A, B, C, L, or M assigned to clinical pathology for eligibility in clinical pathology only. To be eligible in pathological anatomy and clinical pathology, an additional two years in approved institutions is required.

Minimum: 50,000 tests in clinical pathology for one resident.

Category O. Special clinical pathology as part of clinical pathology. Candidates applying for clinical pathology only may receive credit for not in excess of one-quarter of the training period (one year if seeking certification in clinical pathology only, six months if seeking both pathological anatomy and clinical pathology) for work in a special field of clinical pathology, such as bacteriology, serology, etc. Under these circumstances, on request, the special field will be designated on the certificate of the board.

Category P. Research: Residence in certain institutions in which full time is devoted to research with a direct application to the practice of pathological anatomy or clinical pathology may be accepted for credit not to exceed one-third the time requirement (20 months if no clinical internship, 16 months if a clinical internship was taken). The board encourages research and believes that all candidates should carry on investigation during their training in all institutions. Therefore, this category is only for those wishing to do full time research.

AMERICAN BOARD OF PEDIATRICS

Lee F. Hill, President, Des Moines, Iowa
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John McK. Mitchell, Executive Secretary, 6 Cushman Rd., Rosemont, Pa.

REQUIREMENTS FOR CERTIFICATION[*]

All candidates for examination for certification must meet the following requirements:

1. Graduation from an approved medical school.
2. Licensure to practice in the United States prior to issuance of a certificate except in those situations in which a license to practice is not required.
3. One year of rotating, pediatric, or other internship in an approved hospital.
4. Two years of specialized residency-type training in an approved pediatric center.

At least one year of the two years of required residency training must be a full-time medical pediatric inpatient residency or internship in an approved institution. The second year of required residency training may be met in the ways listed below, although the board recommends that whenever possible candidates complete the two years as regular residents.

(a) Graduate School courses will be accepted only in exceptional cases by prior arrangement, up to a maximum of nine months.

(b) A maximum of three months' credit each is allowed for full-time residency type training in allied pediatric subjects such as pediatric allergy, pediatric psychiatry, pediatric pathology, pediatric radiology, newborn service, etc.

(c) A maximum of six months' credit is allowed for residency training in an approved contagious disease hospital.

5. A subsequent term of two years of specialized study or practice or a combination of the two.

Credit for one year toward this requirement is allowed for medical military service regardless of the assignment. The maximum credit that any candidate may receive toward the practice requirement for work done prior to the completion of residency training is one year.

Research residencies which involve little or no clinical training are creditable for only three months. Research residencies which include significant clinical training may be prorated to a total of six months for a year of service. Teaching fellowships may not be offered in lieu of residency appointments.

Both research residencies and teaching fellowships are, of course, entirely acceptable in satisfaction of the practice or further study requirements. Portions of a research residency not applicable for residency training credit may be carried over for practice credit.

Preceptorships are not accepted for credit toward the residency requirement, but are accepted toward the practice requirement.

GRADUATES OF MEDICAL SCHOOLS IN CANADA

Graduates of approved medical schools in Canada and those who have received their internship and residency training in pediatrics in hospitals approved by the Royal College of Physicians and Surgeons of Canada will be eligible for examination for certification under the same regulations as those trained in the United States.

GRADUATES OF FOREIGN MEDICAL SCHOOLS

Citizens of the United States.—Citizens of the United States of America who are graduates of medical schools other than those in the United States and Canada will be processed for eligibility for examination for certification if they can meet all the following requirements:

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[*] A booklet of information, presenting in more detail the data published here, may be obtained from the Executive Secretary of the Board. To avoid misunderstanding, the board urges any candidate whose training is not clearly covered in these regulations to communicate with that office. Whenever possible, this should be done before entering upon the appointment in question.

1. They are graduates of medical schools recommended by the Council on Medical Education and Hospitals of the American Medical Association.

2. They hold a license to practice in the United States.

3. They can meet the internship and residency training requirements of the board as detailed above with the following provisions:

(a) Internship and residency training must be served in hospitals approved by the board in the United States.

(b) A maximum of the internship and one year of residency training may be allowed for such experience obtained in a small list of foreign hospitals recognized by the board. The other year of residency training must be served in a straight inpatient medical pediatric residency appointment in an approved hospital in the United States.

Citizens of the United States of America who are graduates of medical schools other than those in the United States or Canada, and which are not recommended by the Council on Medical Education and Hospitals of the American Medical Association, may be accepted for examination for certification after they have passed successfully part 2 of the examinations of the National Board of Medical Examiners, or the qualification examination of the Educational Council for Foreign Medical Graduates, provided they meet all other requirements of the Board as provided in regulations governing such candidates.

Citizens of Other Countries.—Properly qualified candidates who are permanent residents in and citizens of other countries and are licensed to practice there and who have fulfilled the residency training requirements listed above in the United States or Canada may apply for examination for certification by the American Board of Pediatrics.

Such foreign candidates who are returning to their own country at the end of their training period may be examined without completion of two full years in the practice of pediatrics. The residency training requirements must be completed in full in advance of admission to any part of the examinations.

A special certificate, appropriately identified to distinguish it from the regular certificate of this board, may be issued to such candidates who have passed successfully the examinations of this board after they have completed such a period of practice or further study in their own country which when added to similar experience in the United States or Canada, make a total of two years of the practice of pediatrics.

INFORMATION CONCERNING EXAMINATIONS

The examinations for certification are given in two sections: part 1 is written, part 2 is an oral examination.

Part 1—*Written*

Written examinations are objective in type and are given once each year, usually in January, simultaneously at a number of places scattered throughout the country, and at a few locations abroad. Candidates must pass the written examination before admission to the oral examination will be authorized.

Part 2—*Oral*

Oral examinations are held four to six times each year at centers offering suitable facilities, in locations determined by proximity to the largest number of eligible candidates. One examination session each year is scheduled at a location closer to candidates from some less populous area. As far as possible, candidates are given a choice of locations, taking into account date application is filed, date of eligibility and proximity to the examination site.

Candidates who are admitted to the oral examination (part 2) will not be informed of their grade on the written portion. Their relative standing in part 1 will, however, be utilized in final decision with regard to passing.

Candidates who fail after taking part 2 will not be required to retake part 1 but may be advised to do so in order that they may have an opportunity to improve a low score.

APPLICATION

Application must be made on special blanks, which will be furnished by the executive secretary after a preliminary survey of the applicant's training. Applications may be submitted one year in advance of eligibility date; they will not be accepted earlier. The number of candidates admitted to a given written examination will be determined by the number who can be examined orally during that year, plus a reasonable number of alternates.

LETTERS OF RECOMMENDATION

Letters from two competent pediatricians recommending each applicant must be sent to the executive secretary of the board. These letters should not accompany the application but should be sent directly to the executive secretary.

FEES

The application fee is $75.

The full fee must be remitted with the application. No additional fee is required for second and third written examinations. The fee for second and third oral examinations is $50 each.

CERTIFICATION IN SUBSPECIALTY OF ALLERGY

William C. Deamer, Chairman, San Francisco
Susan Dees, Durham, N. C.
Jerome Glaser, Rochester, N. Y.
George B. Logan, Rochester, Minn.
Harry L. Mueller, Boston
Richard H. Todd, Washington, D. C.

The American Board of Pediatrics has established certification in allergy as a subspecialty of pediatrics.

All candidates must hold a certificate in Pediatrics before submitting an application for examination in Allergy.

Each allergy application is individually considered and must be accepted by the subspecialty board.

INFORMATION CONCERNING EXAMINATION

Allergy examinations consist of written and oral portions. The written examination will be given once a year under a local monitor and must be passed before the candidate is admitted to oral examination. Oral examinations will be held at times and places designated by the subspecialty board. Ample notice will be sent to candidates.

FEES

The application fee for certification in allergy is $100.

The full fee must be remitted with the application.

No additional fee is required for second and third written examinations. The fee for second and third oral examinations is $50 each.

Application forms will be forwarded on request to the office of the Executive Secretary of the American Board of Pediatrics and should be returned to that office when completed. All correspondence should be addressed to him.

REQUIREMENTS

(1) Certification in Pediatrics.

(2) Two years of full-time training in an approved allergy clinic and its associated hospital. At least half of such training must be in pediatric allergy. Three types of allergy clinics have been approved: (a) pediatric, (b) adult, and (c) mixed.

Two years of training in clinics of type (a) or (c), or one year in each, is acceptable. One year in (b) and the other in (c) is not acceptable. Please see Intern and Residency number of J. A. M. A. for listing of approved hospitals and associated clinics. In place of (2) the candidate may take (3).

(3) One year full-time training in an approved allergy clinic plus two years part-time training of at least 200 hours each year in an approved allergy clinic and hospital. At least half of the total experience must be in pediatric allergy. Thus, training which consists only in a combination of (b) and (c) as defined above does not qualify.

OR

(4) Five years, part-time, at least 200 hours each year, in an approved pediatric or mixed allergy clinic and its activities.

Research: If at least half of a candidate's qualifying full-time training is in clinical pediatric allergy, the remainder may be spent in supervised allergy research or in training in adult allergy at an approved clinic, or in a combination of the two.

Preceptorship: Preceptorship alone is not acceptable, but part of a full-time training program (50% or less) may include supervised training in the private office of a qualified allergist, provided such an arrangement is part of the training program of an approved clinic and the preceptor and clinic training run concomitantly.

Credit for courses: Established courses or seminars in Allergy and Immunology, which are attended during the training period, may be credited for part-time training. Instruction such as is given in these subjects by the American Academy of Pediatrics, the Academy of Allergy, or the College of Allergy are examples. Three hours of credit toward part-time training will be allowed for each hour of instruction, but not over 20% of required part-time training hours may be so credited each year.

The candidates should be prepared for oral and written examinations in the theory and practice of allergy. This will include immunology, atopy, allergy of infection, experimental hypersensitivity, the clinical manifestations of allergic disease, especially as they appear in infants and children, and also allergic factors that may be present in other diseases. They must be prepared to discuss diagnostic procedures and methods of treatment and the pharmacology of drugs and physiology of respiration as they relate to allergy and asthma. In controversial matters, they should be familiar with arguments on both sides of such questions.

CERTIFICATE

When accepted the diplomate will receive from the American Board of Pediatrics a certificate in allergy and will be listed as a specialist in allergy.

Prospective applicants for certification in the subspecialty of allergy may apply to the executive secretary of the American Board of Pediatrics.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION

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William H. Schmidt, Vice-chairman, Philadelphia, Pa.
Arthur S. Abramson, New York
Donald A. Covalt, New York
O. Leonard Huddleston, Santa Monica, Calif.
H. Worley Kendell, Peoria, Ill.
A. B. C. Knudson, Washington, D. C.
Frederic J. Kottke, Minneapolis, Minn.
Donald L. Rose, Kansas City, Kans.
Arthur L. Watkins, Boston, Mass.
Earl C. Elkins, Secretary-Treasurer, 200 First St., S. W., Rochester, Minn.

QUALIFICATIONS

A. Satisfactory moral and ethical standing in the profession.

B. A legal license to practice medicine in one or more of the states of the United States, its territories, the District of Columbia, or one or more of the provinces of Canada.

C. Graduation from a medical school approved by the Council on Medical Education and Hospitals or graduation from a foreign medical school which, in the opinion of the board, offers medical education equivalent to such an approved school; completion of an internship in a hospital approved by said Council.

D. A period of study after the internship of not less than three years in a residency approved by the above mentioned Council. This period of study shall include graduate training in basic science as related to physical medicine and rehabilitation and not less than two years of clinical training and experience in physical disabilities related to the fields of rheumatology, neurology, neurosurgery, orthopedics, and medicine.

E. An additional period of not less than two years in full time practice of physical medicine and rehabilitation.

Training in approved residency programs in closely allied medical-surgical fields may be acceptable in part (for D above), but such credit is limited and based on individual interpretation by the board.

In selected cases, a candidate may be deemed eligible for examination on the basis of eight years of full time practice in physical medicine and rehabilitation (as a substitute for D and E above).

EXAMINATION

The examination for certification is given in two parts. Part 1 is written, part 2, oral. Examinations are given once a year and cover certain aspects of the basic sciences and the clinical aspects of physical medicine and rehabilitation (including the role of associated personnel such as the physical therapist, occupational therapist, clinical psychologist, social service worker, and vocational guidance counselor).

APPLICATION

The application form shall contain a record of the candidate's premedical and medical education, internship, graduate study, and verification of full-time practice in the specialty. The application shall be accompanied by a fee of $75 if the candidate is applying for part 1 only, and by a fee of $125 if applying for parts 1 and 2. (In case of rejection of the application, evaluation fee of $25 will be retained by the Board, and the examination fee will be refunded.)

CERTIFICATION

Certificates of the board shall be issued to the effect that the applicant has been found qualified as a specialist in physical medicine and rehabilitation.

AMERICAN BOARD OF PLASTIC SURGERY

S. Milton Dupertuis, Chairman, Pittsburgh
Clarence R. Straatsma, Vice-Chairman, New York
Leslie H. Backus, Buffalo
Truman G. Blocker, Jr., Galveston, Tex.
Herbert Conway, New York
Albert D. Davis, San Francisco
John B. Erich, Rochester, Minn.
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Frank McDowell, Secretary-Treasurer, St. Louis
Mrs. Estelle E. Hillerich, Corresponding Secretary,
4647 Pershing Ave., St. Louis 8

GENERAL REQUIREMENTS

1. Moral and ethical standing in the profession satisfactory to the board.

The board, believing that the practice of "fee splitting" is pernicious, leading as it does to traffic in human life, will reserve the right to inquire particularly into any candidate's practice in regard to this question.

2. Those whose activities are limited to the practice of plastic surgery.

3. This board will accept as applicants for examination only those who are full citizens of the United States or Canada. Notarized statements, not original citizenship papers, attesting to the fact of full citizenship in the United States or Canada must be furnished by foreign-born applicants when the application is filed. Such candidates must have at least two years of practice in plastic surgery in North America after completing the training required by the board.

PROFESSIONAL REQUIREMENTS

The board considers the requirements outlined below to be minimal in attaining its purposes and encourages candidates to take advantage of broadening experience in other fields. Candidates must fulfill the requirements that are in force at the time of their examination and/or certification.

1. Graduation from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association, or graduation from a foreign school considered acceptable by the board.

2. Completion of an internship of not less than one year in a hospital approved by the same Council.

3. Two years of postgraduate work in general surgery, beyond the intern year, as a resident or an assistant resident in a hospital approved by the same Council. This requirement will be increased to three years for those candidates who start their residencies or preceptorships in plastic surgery on or after July 1, 1960.

4. Training in general plastic surgery, including maxillofacial surgery, for an additional period of not less than two years in a residency approved by the same Council, or in a preceptorship approved by the Board. In fulfilling this requirement, there is a limit of one year's credit given for all work done in all governmental plastic surgery residencies (Army, Navy, Veterans Administration hospital, etc.) regardless of the time put in by trainees in such residencies. It is required that all such trainees take one additional year of approved training in plastic surgery in a civilian residency or preceptorship.

5. During these years of training following the internship year, a candidate must hold positions of increasing responsibility for the care and management of patients with surgical conditions. When a candidate receives his training in more than one institution, it is equally imperative that he hold positions of increasing responsibility. He must have sufficient operative experience to acquire surgical skill and judgment through the performances of surgical operations with a high degree of responsibility, but under circumstances providing adequate opportunity for consultation and advice.

6. An additional period of not less than two years of practice in plastic surgery. If a candidate elects to spend one or two additional years in approved training in plastic surgery, one year of such training will be credited toward the required two years of private practice if it can be demonstrated that the candidate held a position of increasing responsibility. It is imperative that one year be in actual private practice in such instances.

The Board gives credit only for training in plastic surgery received in the United States or Canada but may, at its discretion, give credit towards the required private practice period for training in plastic surgery received in countries other than the United States and Canada, each case being determined individually.

The above training in plastic surgery may be taken as a resident in an approved hospital or under an approved preceptorship offering equivalent training (a list of currently approved preceptorships is available from the board office).

The period of special training should emphasize the relation of the basic sciences—anatomy, pathology, physiology, biochemistry, bacteriology—to the application of surgical principles which are fundamental in all branches of surgery, and especially to plastic surgery. In addition, the candidate must understand and be trained in the following subjects: the care of emergencies, shock, hemorrhage, blood replacement, electrolyte and fluid balance, choice of anesthetics, chemotherapy, acidosis and alkalosis, narcotics and hypnotics, wound healing, etc.

The board reserves the privilege of requesting lists of operations done solely by the candidate for one or more years, or of requesting special and extra examinations, written or oral and practical, and of requesting any specific data concerning the candidate that may be deemed advisable before making final decision for certification.

Eligibility rulings or an evaluation of a candidate's qualifications or training cannot be made by the secretary or by any one member of the board. Official evaluations of qualifications are made only by the committee on credentials and requirements or by the entire board where necessary after a review of the candidate's formal application for such rulings. The applicant must allow at least two months for such requests to make the rounds of the committee.

TRAINING FACILITIES

Residencies.—The American Board of Plastic Surgery, in cooperation with the Council on Medical Education and Hospitals of the American Medical Association and the American College of Surgeons, evaluates training facilities in institutions providing acceptable residencies in plastic surgery. The board does not assume the responsibility for independent inspection and approval of residencies. It will inspect and make recommendations for or against approval of a residency in plastic surgery only after the director of the residency has applied to the Residency Review Committee in Plastic Surgery of the Council on Medical Education and Hospitals of the American Medical Association for approval of the residency and after the Council has notified the board to that effect. Therefore, any diplomate of the board wishing approval of a residency under his supervision should apply to the Council for such approval.

The board will make its own inspection, preferably at the same time as the American Medical Association Council inspection, and will report its findings to the Council. Upon completion of consideration by the Council and the board, the hospital will be notified by the Council of the joint action that has been taken, and the hospital and the secretary of the board will be notified simultaneously by the Council to avoid any misunderstanding as to the status of the program.

Preceptorships.—In certain instances the board will accept, in lieu of the required two years' training in an approved residency, training in an approved preceptorship under a fully qualified plastic surgeon when such preceptorship is properly organized and supervised to give the trainee adequate experience and training in plastic surgery of a well-rounded nature. Trainees will be required to keep a detailed record of their experience, presenting this report to the board annually on a report form supplied by the board on request. In preceptorship programs of training it would be well for the preceptor to report annually to the board the name and qualifications of any preceptee under his supervision and the work done by the preceptee. Neither the board nor its individual members can be responsible for the placing of applicants for training. The board considers those residencies approved by the Council on Medical Education and Hospitals of the American Medical Association as acceptable facilities for training in plastic surgery.

It should be kept in mind by all that the primary interest of the board is to encourage well-rounded training in plastic surgery with the aim of producing plastic surgeons capable of doing good work in the wide variety of cases which may come under their care. The standards set up by the board both for preliminary general surgery and for specialized plastic surgery training, are established in an effort to further this aim. The quality of the training received should be reflected in the candidate's ability to achieve good results in his practice, and the examinations of the board are an attempt to judge the ability of the candidate in the specialty of plastic surgery.

Before training in plastic surgery is begun, the plastic surgeon in charge of the residency or preceptorship should ascertain that the trainee's preliminary training in general surgery meets the requirements of the board, that is, two years of residency training in general surgery after the internship year.

The training in plastic and maxillofacial surgery (at least two years) whether in a residency or a preceptorship, should cover a wide field of plastic surgery, both as to type and anatomic distribution. It should include experience in the treatment of congenital and acquired defects and deformities of the face, neck, body, and extremities, for both functional and esthetic reasons. There should be available sufficient material of a diversified nature so that the trainee will be able to pass the examinations of the board after the period of training and the two additional years of private practice. If the available material on one service is inadequate, the deficiency should be made up by affiliation with another plastic surgeon on another service so that a broad experience will be obtained in plastic surgery. The trainee should be provided an opportunity to operate under the direct supervision of the plastic surgeon in charge, and with increasing ability, should be given an opportunity to operate independently on suitable cases under more remote supervision.

MILITARY CREDIT

Credit for military service is given on an individual basis, each case being considered on its own merits, and the amount of credit allowed is determined by the board when the information is submitted with the application.

The Medical Officer's Professional Training Record (DD Form 408) is a record maintained by individual Medical Corps officers for presentation to the various authorized accrediting boards toward certification. This record is presented by the officer to the boards for evaluation of the military experience acquired by Medical Corps officers while serving in the Army Medical Service. This form has been prepared by the surgeons general of the armed services with the assistance of the Council on Medical Education and Hospitals of the American Medical Association and is distributed by the offices of the Surgeons General to their personnel. It is highly important that prospective applicants obtain a copy of this form and that it be submitted with their credentials for evaluation by the board.

CASE REPORTS

Upon approval by the board of a candidate's application for certification, each candidate is required to submit to the board 35 or more case reports illustrative of his independent work in the field of general plastic surgery.

Candidates are admitted to examination only after submitting case reports that meet the required standards of the board and that have been approved by the committee on credentials and requirements.

Case reports must be submitted within one year from the time of such request; otherwise a new application must be filed. The case reports shall conform to conditions which the board may from time to time specify.

Case reports must be received in the office of the board by January 1 for those who desire to be considered for the spring (May-June) examinations of the board and by July 1 for the fall (October-November) examinations. There will be no exceptions to these two deadlines.

The 35 case reports must be of a diversified nature and must be submitted to the office of the board together with before and after photographs. They should be of the following distribution:

1. Cleft lip: 1 to 3 cases
2. Cleft palate: 1 to 3 cases
3. Traumatic defects requiring reconstructive surgery:
   (a) Face and neck: 2 to 4 cases
   (b) Body: 1 to 4 cases
   (c) Extremities: 1 to 6 cases
4. Acute burns: 2 to 4 cases
5. Fracture of facial bones, excepting nasal fractures: 1 to 3 cases
6. Esthetic operations of sufficient variety: 6 to 12 cases
7. Plastic surgery of the hand: 2 to 4 cases
8. Malignancies, or conditions prone to malignancies (eradication and repair):
   (a) Face: 2 to 4 cases
   (b) Body: 1 to 3 cases
   (c) Extremities: 2 to 4 cases
9. Congenital anomalies: 1 to 6 cases
   (a) Examples:
   (1) Syndactylism
   (2) Congenital absence (partial or total) of external ear
   (3) Hypospadias
   (4) Bands (constricting)
   (5) Thyroglossal duct cyst
   (6) Extensive nevi, etc.

If the case reports and lists of operations are approved, the candidate will receive subsequent information regarding taking the examinations. The board at its discretion may request certification of case reports by the hospital where the operations were performed. The following form should accompany the case reports: "I hereby certify that the planning and essential surgical procedures described herein were carried out by me as an independent operator."

Every candidate's final acceptability for examination is based not only on the evaluation of his training qualifications but on his professional ability as a plastic surgeon, his ethical standing in the community, and the strict limitation of his work to plastic surgery.

A candidate should remember that these case reports are documentary evidence of his ability and that the material in them and the manner of presentation are important evidences of his ability.

EXAMINATIONS

In instances where a candidate submits case reports that do not meet the standards of the board, he will be required to submit additional case reports or an entirely new set of 35 within a period of one year. If this second series of new case reports again do not meet the standards of the board, the candidate may be required to take additional training (of length and type specified by the board) before he will be allowed to submit any further case reports.

After a candidate has been notified that he has fulfilled the preliminary requirements and that his case reports have been approved, he will be required to take the qualifying examination within a period of three years.

After approval of the case reports, and prior to the examination, the candidate will be visited at his place of practice by a member or members of the board to observe him operate and to examine a number of his preoperative and postoperative cases.

The qualifying examinations are given twice yearly, in the spring and fall. The spring examination is given immediately preceding, during, or following the annual meeting of the American Association of Plastic Surgeons (usually in May), and the fall examination is given immediately preceding, during, or following the annual meeting of the American Society of Plastic and Reconstructive Surgery (usually in October). Candidates are required to go to the designated center for the qualifying examination, which will last three days. These centers will be the city in which the meetings of these two organizations are held if the proper clinic and hospital facilities are available, otherwise in some nearby city where such material is available. Arrangements for all examinations are made by the examination committee.

A written examination will consume all of the first day and half of the second day. An oral and practical examination will consume the afternoon of the second day and all of the third day. The subjects of the written examination are (1) theory and practice of plastic surgery, (2) applied anatomy, applied physiology, (3) pathology, bacteriology, clinical laboratory methods (pharmacology), (4) reaction of tissue to injury, surgical accidents, anesthesia. A general oral examination pertaining to plastic surgery will be given. In the practical part of the examination, the examiner will present a group of patients for examination by the candidates, and the candidates will be quizzed on methods of procedure-diagnosis, treatment, technique, and so on. Slides of preoperative conditions will be shown on a screen and the candidate asked to make a quick diagnosis of the items and to tabulate in the order of their importance the methods of treatment. Microscopic slides of the average pathological tissue falling within the province of the plastic surgeon will be given the candidates, and they will be asked to write a description and diagnosis.

GRADES

To be considered as passing, the candidate will be required to receive a grade of at least 65% in each portion of the written examination and an average grade of 75% on the entire written and oral examination.

CERTIFICATION

After a candidate has met the requirements for eligibility and passed the examinations of the board, a certificate attesting his qualifications in plastic surgery will be issued to him by the board, signed by its officers and having the seal of the board affixed thereto. It shall be the prerogative of the board to determine the fitness professionally and ethically of any candidate for its certificate, and the action or decision of the board regarding the certification of any candidate shall be final.

FEES

The fee for application and examination is $150. Of this sum, $25 must accompany the application, and the remaining $125 must be paid when the candidate is notified of acceptance for examination. There will be no refunds. This fee may be increased at the discretion of the board. The board is a nonprofit organization, and the fees of candidates are used solely for defraying the actual expenses of the board. The members of the board serve without remuneration. Because of the limited number of surgeons certified by this board it is necessary for a limited time to request a voluntary annual contribution of $10 from diplomates after the first year's certification to help defray expenses.

THE AMERICAN BOARD OF PREVENTIVE MEDICINE, INC.

Ernest L. Stebbins, Chairman, Baltimore
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Otis O. Benson Jr., Vice-chairman for Aviation Medicine, Randolph Air Force Base, Tex.
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James H. Sterner, Rochester, N. Y.
Tom F. Whayne, Secretary-Treasurer, 615 N. Wolfe St., Baltimore 5, Md.

ELIGIBILITY REQUIREMENTS FOR EXAMINATION

Each applicant for a Certificate in Public Health, Aviation Medicine, or Occupational Medicine is required to meet certain eligibility requirements and to pass an examination. Such eligibility requirements are set forth in the by-laws of the Board. For the information of applicants such requirements are briefly outlined below; but for a full statement thereof reference must be made to the by-laws, as from time to time in force, by which alone such requirements are governed:

GENERAL REQUIREMENTS

1. Good moral character and high ethical and professional standing;
2. Graduation from a medical school in the United States or Canada approved by the Council on Medical Education and Hospitals of the American Medical Association, or from a foreign school satisfactory to the Board;
3. A hospital internship of at least one year approved by the Council on Medical Education and Hospitals of the American Medical Association, or a foreign hospital internship satisfactory to the Board; and
4. Authority to practice medicine in a State, territory, commonwealth or possession of the United States or in a Province of Canada.

SPECIAL REQUIREMENTS IN PUBLIC HEALTH

1. Successful completion (after internship) of at least one academic year of graduate study leading to the degree of Master of Public Health or an equivalent degree or diploma in a school of public health accredited for the purpose of such graduate study by the American Public Health Association; or training or study deemed by the Board to be substantially equivalent to such graduate study;

2. Residency (after internship) of at least two years of field experience in general public health practice, which included planned instruction, observation, and active participation in a comprehensive, organized, public health program approved* by the Residency Review Committee for Preventive Medicine of the American Medical Association's Council on Medical Education and Hospitals and the Board; or an equivalent Canadian residency approved by the Board; one year of such period in both instances may be an approved clinical residency in a field directly related to public health;

3. A period (after internship) of not less than three years, in addition to 1 and 2 above, of special training in or teaching or practice of public health;

4. Three years of the experience outlined in 2 and 3 above must have been obtained within the five-year period immediately prior to application for certification; and

5. Limitation of practice to full-time teaching or practice of public health as a specialty.

SPECIAL REQUIREMENTS IN AVIATION MEDICINE

1. Successful completion (after internship) of at least two academic years of graduate study in preventive medicine and aviation medicine, one year of which graduate study shall be in a school of public health accredited for the purpose of such graduate study by the American Public Health Association and one year of which shall be in a school of aviation medicine accredited for the purpose of such graduate study by the Council on Medical Education and Hospitals of the American Medical Association; or training or study deemed by the Board to be substantially equivalent to such graduate study;

2. Residency (after internship) of at least one year of supervised experience in aviation medical practice, which included planned instruction, observation, and active participation in a comprehensive, organized program of aviation medicine;

3. Supervised practice of aviation medicine (after internship) of not less than one year, in addition to 1 and 2 above, of special training in or teaching or practice of aviation medicine;

4. A period (after internship) of not less than two years, in addition to 1, 2, and 3 above, of special training in or teaching, research, or practice of aviation medicine;

5. Three years of the experience outlined in 2, 3, and 4 above, must have been obtained within the five-year period immediately prior to application for certification; and

6. Limitation of practice to full-time teaching, research, or practice of aviation medicine.

SPECIAL REQUIREMENTS IN OCCUPATIONAL MEDICINE

1. Successful completion (after internship) of at least two academic years of graduate study in preventive and occupational medicine in a school of medicine, a university graduate school, a school of public health, or a combination of these schools, all of which must be accredited for such graduate study by the Council on Medical Education and Hospitals of the American Medical Association; or training or study deemed by the Board to be substantially equivalent to such graduate study.

2. Completion (after internship) of not less than one year, in addition to 1 above, of supervised experience in occupational medical practice in an industrial or medical organization, which shall have provided planned instruction, observation and active participation in a comprehensive program of occupational medicine; or a period of experience deemed by the Board to be substantially equivalent to such year of supervised experience;

3. A period (after internship) of not less than three years, in addition to 1 and 2 above, of special training in or teaching or practice of occupational medicine;

4. Three years of the experience outlined in 2 and 3 above must have been obtained within the five-year period immediately prior to application for certification; and

5. Limitation of practice to full-time teaching, research or practice of occupational medicine.

APPLICATIONS FOR EXAMINATION AND REEXAMINATION

Each application for examination must be made on the prescribed form (which may be obtained from the Secretary of the American Board of Preventive Medicine), and must be filed with the Secretary, ordinarily not less than 90 days prior to the date of examination. It must be accompanied by the required documentation, application fee, and two recent, clear, unmounted, autographed photographs of the applicant, one of which should be attached to the application and the other unattached.

No member of the Board is authorized to give an opinion as to the eligibility of candidates. The determination of eligibility will be made only by the Board, after receiving full application information. Each candidate must comply with Board regulations in effect at the time the examination is taken and also those in effect at the time the certificate (if any) is issued, regardless of when his original application was filed.

An applicant declared ineligible for admission to examination may refile or reopen his application on the basis of new or additional information within two years of the filing date of his original application, without payment of an additional application fee.

An applicant declared eligible for admission to examination but who fails to submit to examination within three years of the date of the filing of his application is required to file a new application and to pay a new application fee.

Candidates failing the examination may, upon timely application and payment of appropriate fee, be admitted to reexamination within a specified period.

Candidates failing three examinations will not be admitted to subsequent examinations unless the Board so directs.

MULTIPLE CERTIFICATION

A person who has been certified in one affiliated specialty may apply for certification in another affiliated specialty; however, the applicant must meet in full the special requirements for each of the affiliated specialties in which he desires to be examined.

In determining whether the applicant meets such requirements, no period of training or experience, other than graduate study, will be taken into account if the same period shall have been taken into account in determining his eligibility for another affiliated specialty.

FEES

(Applies to candidates making application subsequent to June 30, 1959, and, in the case of examination fees, to examinations taken subsequent to that date.)

The application fee is $25. It must be submitted with application and is not refundable.

The examination fee is $100. It is payable when applicant is notified of acceptance for examination; if paid prior thereto, it is not refundable after such notification has been given.

No additional fee is payable for the issuance of a certificate.

Re-examination fees are: each part taken, $25; examination fees, additional affiliated specialty, each $50.

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*Applies to residencies undertaken on and after July 1, 1959.

EXAMINATIONS

Examinations will be held from time to time and in various places depending upon need as indicated by applications received. Examinations in some instances will be held in connection with the annual meetings of the nominating organizations and also may be held at other times and at other places so located geographically as to minimize travel for the applicants.

The written examination consists of two parts:

Part one is a comprehensive written examination designed to test the knowledge of the applicant in the basic principles of preventive medicine. Part two is a comprehensive written examination designed to test the knowledge of the applicant in the special field in which he requests certification.

An oral or practical examination is also required, which usually will be held at the completion of the written examination. An endeavor will be made to adapt the details of the oral or practical examination to each candidate's experience and practice.

Candidates for certification in a second or third affiliated specialty will be required to pass only that portion of the written examination relating specifically to such field.

The examiners will report upon each candidate to the assembled Board, by which the result of the examination will be considered.

AMERICAN BOARD OF PROCTOLOGY

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A. W. Martin Marino, President Elect, Brooklyn, N. Y.
Robert J. Rowe, Vice President, Dallas, Texas
Harry E. Bacon, Philadelphia
Frederick B. Campbell, Kansas City, Mo.
Walter A. Fansler, Minneapolis
Clifford E. Hardwick, Portland, Ore.
M. O. Hines, New Orleans
R. A. Scarborough, San Francisco
Stuart T. Ross, Secretary, 520 Franklin Avenue, Garden City, N. Y.

QUALIFICATIONS AND REQUIREMENTS

General

All candidates shall comply with the following regulations:

1. A candidate shall possess moral, ethical, and professional qualifications acceptable to the Board.
2. He shall possess full citizenship in the country in which he practices.
3. He shall limit his practice to proctology, shall appear personally before the Board, and shall submit to the required examinations.
4. He shall deliver to the Board upon request an official record of patients hospitalized by him during the year prior to the date of submission of the application.
5. He shall submit a bibliography of papers and books published by him.

PROFESSIONAL QUALIFICATIONS

1. He shall be a graduate of a medical school approved by the Council on Medical Education and Hospitals of the American Medical Association.
2. He shall possess a license to practice medicine in the country of his residence.
3. He shall have completed an internship, preferably of the general rotating type, of not less than 12 months in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association.

SPECIAL PROFESSIONAL QUALIFICATIONS

1. He shall have completed a minimum of three years of an approved general surgical residency and one of the following:
   a. Two years of a proctologic residency approved by the Board; or
   b. Two years of a proctologic preceptorship approved by the Board.
2. Applicants who present evidence of exceptional training and experience in colonic and rectal surgery during their three years of training in general surgery may, upon special application and approval by the Board, be accepted for examination following one year of approved training in Proctology.

APPLICATIONS

Each candidate for examination shall submit an application prepared upon the prescribed form which may be obtained from the Secretary of the Board. It shall contain a record of the candidate's premedical and medical training, internships, residencies, precepteeships, other postgraduate study, hospital and dispensary appointments, teaching positions, service in the armed forces, service in federal, state or local government, membership in medical societies, and any additional information considered valuable by the Board.

The application shall be signed by two proctologists. It shall be accompanied by two unmounted autographed recent photographs of the candidate, letters of endorsement from appropriate sources and the application fee. It shall be filed with the Secretary not less than 90 days prior to the date of examination.

EXAMINATIONS

Examinations are conducted at times and places determined by the Board and are announced in The Journal of the American Medical Association.

Seventy-five per cent is the passing grade on all examinations.

Examination papers are identified only by numbers and the examiners do not know the identity of the examinees.

Part 1: This consists of a comprehensive written examination in the basic sciences, including anatomy, physiology, pathology, bacteriology, and biochemistry. The examination is held in the fall of the simultaneously in several cities of the United States.

Upon approval of the American Board of Proctology, candidates who have passed part 1 examinations of the American Board of Surgery and who have completed required training in proctology may not be required to take part 1 of the examinations of the American Board of Proctology.

Part 2: This is a practical examination which is held in the community in which the candidate conducts his professional activities. (It may be omitted at the discretion of the Board, in which case the candidate will be notified by the Secretary.) It is endeavored to arrange the examination at a time suitable to both the candidate and the examiner. The examination includes inspection of:

1. Surgical operations.
2. Hospital rounds.
3. Hospital and office records.
4. Office practice.

Part 3: This consists of comprehensive written and oral examinations on the theory and practice of proctology and includes roentgenologic interpretation. The examination is usually held in the fall of the year in one designated city of the United States. The candidate is not admitted to part 3 examinations until he has completed the requirements of part 2.

The oral portion of the examination is conducted by members of the Board or its designated examiners. An attempt is made to ascertain the candidate's knowledge of current proctologic literature, his knowledge of the basic sciences, and the extent of his clinical experience and other qualifications.

FEES

Application fee: A fee of $25.00 shall accompany the application.

Examination fee: A fee of $150.00 is due and payable when the candidate is notified that he has been approved for examination.

No fee shall be returned to the candidate without Board approval.

All fees shall be made payable to the American Board of Proctology and shall be sent to the secretary.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY

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Francis M. Forster, Washington, D. C.
Francis J. Gerty, Chicago
William Malamud, Boston
David A. Boyd Jr., Secretary-Treasurer, 102 Second Ave., S. W., Rochester, Minn.

APPLICATION FOR CERTIFICATION

An application, in order to be considered at any meeting of the Board, must be in the hands of the Secretary of the Board not less than 90 days before the date of such meeting. A proper application form may be obtained from the Secretary. Application may be made for certification in psychiatry or in neurology or in both fields. Applications will be formally considered only when made on the official application blank in such form as may be adopted from time to time by the Board and when accompanied by an application fee in such amount as may be fixed by the Board.

The Secretary of the Board, upon receipt of an application, shall forthwith make inquiries from those to whom the candidate refers and from such other persons as the Secretary may deem desirable and shall verify the candidate's record from the biographical records of the American Medical Association, after which he shall forward the application to the Committee on Credentials. This Committee shall consider the application and other information available and notify the Secretary whether the application is accepted. The certification of a candidate in either psychiatry or neurology, or both, shall be approved by a majority of the members of the entire Board at any meeting held for such certification.

FORM OF CERTIFICATION

There shall be separate certification in psychiatry and in neurology and two certifications or a combined certification for those qualified in both fields. The certification shall be in such form as is approved by the Board of Directors.

General Requirements for Applicants. Each application for a certificate must establish that:

(a) He is a physician duly licensed by law to practice medicine.

(b) He is of acceptable ethical and professional standing.

(c) He is now a member of the American Medical Association. Exceptions to the foregoing may be made at the discretion of the Board for good and sufficient reasons.

(d) He has satisfactorily completed adequate training in psychiatry or neurology, or both, as a specialty.

CLASSES OF APPLICANTS

Class A

Applicants who graduated from an approved medical school before the foundation of the Board (1934) will not be held to the strict interpretation of the published requirements in formal graduate training. Under such circumstances the Board will consider the training and experience of the applicant and decide whether or not he will be admitted to the examinations. For such graduates the Board will consider 10 years of full-time acceptable experience in psychiatry or neurology in lieu of the formal training requirements. Should the candidate then apply for supplementary certification, the Credentials Committee will require five years of additional acceptable experience in the supplementary field.

Class B

Applicants who graduated from an approved medical school after 1934 shall fulfill the following special requirements.

PROFESSIONAL EDUCATION

1. Graduation from a medical school in the United States or Canada approved by the Council on Medical Education and Hospitals of the American Medical Association. In the case of an applicant whose medical training has been received outside the United States and Canada, such training must be satisfactory to the aforementioned Council.
2. Satisfactory completion of a year's internship approved by the same Council on general medicine, general surgery, pediatrics, or a rotating service.
3. The nine-month wartime internships will be accepted as an equivalent of one year.

SPECIALIZED TRAINING

Admission to the examination for certification in psychiatry or in neurology requires a total of five calendar years of training and experience, three years of which must be specialized training satisfactorily completed in approved training centers, plus two years of experience.

Admission to the examination for certification in both psychiatry and neurology requires a total of six calendar years of training and experience, five years of which must be specialized training satisfactorily completed in approved training centers, plus one year of experience. The specialized training may be subdivided into two and one-half years each in psychiatry and neurology or three years in one subject and two years in the other. The required years of experience should be spent in clinical practice with major responsibility for the care of patients.

All applicants who wish to qualify for examination for certification in psychiatry or neurology under the regulations relating to training credit and who began training on or after July 1, 1956, must show that at least 24 months of their residency training have been secured in residency training programs approved for at least two years of residency training in the specialty in which they seek certification.

The training for psychiatrists should include clinical work with psychoneurotic and psychotic patients, combined with the study of basic psychiatric sciences, medical and social psychology, psychopathology, psychotherapy, and the physiological therapies, including a basic knowledge of the form, function, and pertinent pathology of the nervous system. The training should be supervised and guided by teachers competent to develop skill and understanding in the utilization of such basic knowledge in dealing with patients. Mere factual knowledge is not sufficient. This training period should include instruction in the psychiatric aspects of general medical and surgical conditions and the behavior disorders of children and adolescents sufficient to develop practical ability to direct the treatment of such conditions. It should also include collaborative work with social workers, clinical psychologists, courts, and other social agencies. The training program of the candidate for certification in psychiatry should include sufficient training in neurology to enable him to recognize and to evaluate the evidences of organic neurological disease.

The training for neurologists should be based on clinical work with adults and children with neurological disorders, including the neurological complications of medical and surgical conditions. This should be combined with study of the basic neurological sciences, neuroanatomy, neurophysiology, neuropathology, and neuroroentgenology. This training should be supervised and guided by teachers competent to develop skill and understanding in the utilization of such basic knowledge in dealing with patients. Mere factual knowledge is not sufficient. This training should include sufficient training in psychiatry to enable the candidate to recognize and evaluate the common psychiatric reactions.

The Board offers the foregoing two paragraphs as an outline of desirable training. If, however, the candidate has evidence of equivalent qualifications of training and experience not in the pattern here formulated, this evidence with appropriate documentary support may be included in his application for evaluation and possible approval by the Board.

Candidates seeking certification in both neurology and psychiatry, or supplementary certification in one after being certified in the other, must submit evidence satisfactory to the Board of an additional two years of full-time basic training in the supplementary specialty.

Thus, no candidate is eligible for examination by the Board until he has completed at least five years of special training and experience in neurology or in psychiatry for a single certificate, or at least six years of special training and experience in neurology and psychiatry for certification in both neurology and psychiatry.

The Board will give not more than six months of credit for not less than six months of training in an approved training center for Internal Medicine or Pediatrics in lieu of six months of experience to candidates for the certificate in psychiatry or neurology but not to candidates for certification in both psychiatry and neurology.

The Board will give credit for one year of training in Child Psychiatry providing it is the third year of the required three years of special training required by the Board and providing it is taken in a center approved by this Board for training in child psychiatry. After July 1, 1956, training credit for work in the field of child psychiatry may be gained only by participation in a hospital residency training program that is regularly approved. After that date, all independent training approval of psychiatric clinics for children is discontinued.

The lists of training programs approved by this Board and by the Council on Medical Education and Hospitals of the American Medical Association may be found in the current issues of the Educational Number of the Journal of the American Medical Association.

TRAINING IN THE ARMED FORCES

Training and experience credit toward requirements for examination will be granted for military duty in the Korean emergency under certain conditions. This policy relates to active military medic duty since July 1, 1950. One year of training credit will be granted for one year spent in full-time psychiatric and/or neurologic duties. Additional training credit will be granted for that amount of time spent in approved training programs. Experience credit will be granted for any remaining time spent in full-time psychiatric and/or neurologic assignments. Double credit will not be granted for any single period of time.

For military duty after January 1, 1954, only experience credit will be granted for full-time psychiatric and/or neurologic duties. Training credit will be granted for residency assignments in regularly approved training programs.

Training credit for full-time psychiatric and/or neurologic assignments in unapproved military programs or services between the dates of January 1, 1950 and January 1, 1954, will be terminated as of January 1, 1959.

EXAMINATIONS

Dates and places of examinations shall be set by the Board at its discretion and shall be announced in THE JOURNAL of the American Medical Association, in the *American Journal of Psychiatry*, in the *Journal of Nervous and Mental Diseases*, and in the *Archives of Neurology and Psychiatry*.

Though the purpose of the examination is to test the competence of the candidate in psychiatry or neurology or both, it must not be forgotten that both these medical disciplines constitute part of the broad field of general medicine. The Board requires some proficiency in neurology on the part of those it certifies in psychiatry, and vice versa, but it examines the candidate in accordance with the certificate he seeks. The examinations will be of such type that no adequately trained person will fail, and yet they will be sufficiently searching so that the specialist in fact may be separated from the specialist in name. The practical examination will include the examination of patients under the supervision of the examiner. The manner of examining patients, and the reasoning and deductions therefrom, will constitute an important part of the examination. Oral and practical examinations will be given in the basic sciences with special regard to their clinical implications. Written examinations may be given at the discretion of the Board. The examination for certification in psychiatry will differ from the examination for certification in neurology.

PAYMENT OF FEES

The candidate, upon filing his application, shall accompany it with an application fee of $50.00, which is not returnable. If a preliminary written examination has been decreed, an additional $25.00 fee will be required at the time of the applicant's acceptance. When notified by the Secretary that he is accepted for the oral and practical examination, the candidate shall send to the Secretary an examination fee of $75.00. A candidate who has been certified in either psychiatry or neurology and who has been admitted to supplementary examination for the other certificate shall pay an additional examination fee of $75.00.

A candidate who has failed in one examination is eligible for reexamination within one year upon payment of a reexamination fee of $75.00. After the year has elapsed, he must submit a new application and pay new application and examination fees. If he fails the reexamination, he may, after two years have elapsed, submit a new application and $50.00, present evidence of further training, and pay an examination fee of $75.00.

A candidate who fails in one or two subjects is eligible for reexamination in those subjects within one year upon payment of a reexamination fee of $50.00. After the year has elapsed he must submit a new application and pay new application and examination fees and repeat the entire examination. If he fails the reexamination, he may apply again for the complete examination after two years upon submission of evidence of further training and upon payment of an application fee of $50.00. If admitted to the examination, he must pay a new examination fee of $75.00.

Any candidate who finds himself unable to attend an examination to which he has been admitted and does not notify the Secretary at least three months before the date of the examination will forfeit his examination fee. Any candidate who fails to appear for examination within a period of three years following the date of notification of eligibility for examination shall be required to submit a new application and pay the attendant fee. If a candidate dies before his certificate is issued, all fees will be returned to his estate.

Beginning January 1, 1958, all unused examination fees or portions of examination fees on deposit in the Board Office will be forfeited by the candidate to the Board when the application lapses by going out of date. Further, all unused examination fees, or partial, unused examination fees, deposited before the date of January 1, 1952, will automatically be forfeited by the candidate to the Board on January 1, 1958.

AMERICAN BOARD OF RADIOLOGY

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Douglas Quick, New York
Leo G. Rigler, Los Angeles
Ernest H. Wood, Chapel Hill, N. C.
H. Dabney Kerr, Secretary, Kahler Hotel Bldg., Rochester, Minn.

CERTIFICATES

A certificate granted by this board does not of itself confer, or purport to confer, any degree, or legal qualifications, privileges, or license to practice radiology. Certificates of the board shall be issued in one of three categories:

1. *Radiology:* that branch of medicine which deals with the diagnostic and therapeutic application of radiant energy including roentgen rays, radium and radioisotopes.
2. *Diagnostic Roentgenology:* that branch of radiology which deals with the diagnostic application of roentgen rays.
3. *Therapeutic Radiology:* that branch of radiology which deals with the therapeutic application of roentgen rays, radium and radioactive isotopes.
4. *Radiological Physics:* that branch of physics which deals with the medical application of roentgen rays, gamma rays, radioisotopes, nuclear reactions, and particle accelerators.
5. *Roentgen-ray and Gamma-ray Physics:* that branch of radiological physics which deals with roentgen rays and gamma rays.
6. *Medical Nuclear Physics:* that branch of radiological physics which deals with radioisotopes, nuclear reactions and particle accelerators.

GENERAL REQUIREMENTS AND QUALIFICATIONS

Each applicant shall be required to present evidence that he has met the following standards:

1. Satisfactory moral and ethical standing in the profession.
2. A license to practice medicine in the state or county in which he resides.
3. Holds himself out to be a specialist in radiology or one of its branches as defined and devoted his time to the practice of radiology or one of its branches.
4. He is a citizen of the United States or Canada. A candidate from another country must be a permanent resident of that country and a citizen thereof.

PROFESSIONAL EDUCATION

1. Graduation from a medical school recognized by the Council on Medical Education and Hospitals of the American Medical Association.

2. Completion of an internship of not less than one year in a hospital approved by the same Council. After completion of the internship, there shall be a period of special training (length of time as indicated below) in an approved department of radiology.

Radiology: Those beginning their training before July 1, 1956, must have three years formal residency training in an approved department of radiology.

Those beginning their training on July 1, 1956, or thereafter must have three years formal residency training in an approved department of radiology plus an additional year of either further training or practice. The three-year training period must include the equivalent of six months (total) in pathology and isotopes.

Diagnostic Roentgenology: Those beginning their training before July 1, 1956, must have two and one-half years formal residency training in an approved department of radiology. The equivalent of six months of this time must have been devoted to Pathology.

Those beginning their training on July 1, 1956, must have two and one-half years formal residency training in an approved department of radiology (the equivalent of six months of which time must have been devoted to pathology) plus an additional year of either further training or practice.

Those beginning their training on July 1, 1957, or thereafter will be required to take three years formal residency training in an approved department of radiology—the first year of which must be spent in basic training (pathology, physics, and basic radiological techniques) followed by two years clinical training.

Therapeutic Radiology: Those beginning their training before July 1, 1956, must have two and one-half years formal residency training in an approved department of radiology. The equivalent of six months of this time must have been devoted to Pathology.

Those beginning their training on July 1, 1956, must have two and one-half years formal residency training in an approved department of radiology (the equivalent of six months of which time must have been devoted to pathology) plus an additional year of either further training or practice.

Those beginning their training on July 1, 1957 or thereafter will be required to take three years formal residency training in an approved department of radiology—the first year of which must be spent in basic training (pathology, physics, physics of isotopes, and basic radiologic techniques) followed by two years clinical training. They will also be required to take an additional year of either further training or practice.

Those applying for therapeutic radiology alone must show evidence of personal experience in the use of intracavitary and interstitial radium or equivalent sources, as well as proficiency in roentgen therapy.

Prior to July 1, 1960, those candidates desiring to be certified in either radiology or therapeutic radiology will be urged to take an examination in nuclear medicine.

Those candidates previously certified in roentgenology desiring to complete their certificates in radiology (including nuclear medicine) will be required to have the equivalent of six months full-time radium and isotope training in an approved department of radiology.

Prior to July 1, 1960, those candidates who have been previously certified in roentgenology and who do not desire to be examined in nuclear medicine must have the equivalent of three months full time radium training in an approved department of radiology.

EXAMINATIONS

Usually two examinations are held each year. At present, examinations are practical and oral. The examinations are designed to test the candidate's fitness to practice radiology or one of its branches as a specialty.

The examination consists of tests in film interpretation and an oral examination in pathology, physiology, radiophysics, and radiobiology, as well as the clinical application of roentgen rays, radium, and radioactive isotopes. The applicant is also examined in "professional adaptability," in an attempt to ascertain his attitude toward his fellow practitioners and his patients.

AMERICAN BOARD OF SURGERY

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William H. Snyder Jr., Los Angeles
Henry Swan, Denver
Robert M. Zollinger, Columbus, Ohio
John B. Flick, Secretary-Treasurer, 1617 Pennsylvania Blvd., Philadelphia 3.

GENERAL QUALIFICATIONS

An ethical standing in the profession and a moral status in the community which are satisfactory to the Board.

Engagement in the practice of surgery.

PRELIMINARY TRAINING

Graduation from an approved medical school in the United States or Canada or from medical schools acceptable to the Board in other countries.

Completion of an internship (straight or rotating) of not less than one year in a hospital approved by the Council on Medical Education and Hospitals of the A. M. A. or its equivalent in the opinion of the Board.

SPECIAL TRAINING

The American Board of Surgery is guided by the evaluation of residency training programs made by the Conference Committee on Graduate Training in Surgery and does not itself conduct such surveys.

The Board interprets the term general surgery in a comprehensive manner and expects candidates to have knowledge of the basic principles applied in the treatment of fractures, head injuries, or other forms of trauma, and of the more common procedures in plastic, gynecologic, orthopedic, neurologic, thoracic, and urologic surgery.

Basic Sciences

It is fundamental to the concept of an approved residency in general surgery that the program provide for properly organized, integrated, and progressively graded clinical training in this specialty. This presupposes a continuity of clinical experience under the supervision of the surgical staff of the hospital or hospitals in which such training is conducted. Accordingly, while recognizing the value of formal courses in the study of surgery and the basic sciences at approved graduate schools of medicine, the Board will not accept these courses as part of a three or four-year residency program in lieu of clinical experience. Furthermore, the integration of basic sciences, particularly pathology, with clinical training is considered superior to formal courses in these subjects.

Senior Year

The most important single factor in the development of a surgeon is the opportunity under guidance and supervision to grow by progressive and succeeding stages to the stature of complete responsibility for the surgical care of patients. Major operative experience and senior responsibility are an essential part of surgical education and training. For this reason the Board cannot accept for examination candidates who have not had such experience in general surgery, regardless of the number of years in training.

Since a majority of residency training programs do not provide a sufficient accretion of operative experience and personal responsibility until the completion of the senior or final year, the Board requires that the candidate have had this senior year in order to become eligible for examination. Because it is recognized that some flexibility and well-considered experimentation are essential to progress in surgical, as well as other forms of education, the Examination Committee of the Board is prepared to give individual consideration to applicants whose training in general appears adequate although it may not meet all of the following specified requirements.

TYPES OF PROGRAMS

The requirements for examination may be fulfilled by either of two programs. These are considered to be minimal in attaining the purposes of the Board and do not preclude additional desirable educational experiences which may strengthen the individual residency training program.

The Board may, at its discretion, require that a member of the Board, or other designated diplomate, observe and report upon the clinical performance of the candidate before considering his eligibility for examination or certification.

The Board reserves the right to require a candidate to submit a list of the operative procedures performed by him during his training period.

Group 1 Program

Completion of a graded residency in general surgery of at least four years duration, including the senior year, in an institution or institutions acceptable to the Board and approved for four years of training by the Conference Committee on Graduate Training in Surgery is required.

An approved four-year residency may include a research project or an assignment to a basic science department such as pathology, physiology, or anatomy, provided this is an integral part of the program. The program must include at least three years of clinical surgery.

The Board accepts training of not more than one year duration in "affiliate hospitals" as part of its basic formal educational requirements. Such "affiliate hospital" training must have been part of the graded residency program of an institution approved for four years by the Conference Committee. The senior year must have been spent in the parent institution holding the approval of the Conference Committee, except in those instances where the senior year in the "affiliate hospital" is, in the opinion of the Conference Committee, equivalent in training value to the senior year in the parent institution and is under the same supervision.

The candidate who completes only four years of an approved program designed for more than four years, and thus does not have the senior or final year of the residency, may submit his qualifications for special consideration by the Examination Committee. The Committee can recommend acceptance of the candidate for examination in group 1 or group 2, provided the evidence indicates the candidate has had adequate operative experience and clinical responsibility as certified by the Chief of Service.

Residency credit will be granted for surgical internship to a candidate who has completed a prior year of acceptable internship when the surgical internship is part of a graded program approved for four years by the Conference Committee.

Group 2 Program

Completion of a graded residency in general surgery of at least three years duration, including the senior year, in an institution or institutions acceptable to the Board and approved for at least three years of training by the Conference Committee on Graduate Training in Surgery is the basic requirement.

Residency credit will not be granted for separate periods of time devoted exclusively to research or a preclinical discipline although the day to day integration of these disciplines with clinical surgery is highly desirable. The program must have included three years of clinical surgery and the final year must have been spent in the capacity of senior or chief resident in general surgery.

Two additional years of training beyond the three years of residency to complete a total of five are necessary to meet the requirements for examination.

These may include:

(a) Practice of surgery under acceptable supervision (preceptorship). By "acceptable supervision" is meant an arrangement with a preceptor acceptable to the Board who should inform the Board in writing of his willingness to assume responsibility for the candidate's further training. Before the candidate's eligibility for examination can be considered, he will be required to submit to the Board a list of the operative procedures performed by him during the period of supervised practice, and the preceptor will be requested to vouch for the candidate's integrity, surgical judgment, and technical skill. The acceptance of supervised practice in fulfillment of part of the Board's requirements will be contingent upon the candidate's having had adequate clinical opportunities to fortify residency training and considerable responsibility in the care of patients, including the performance of major operative procedures under supervision.

(b) The study of surgery and the basic sciences in an approved graduate school of medicine on a full-time basis and for a consecutive period of not less than nine months, or one school year. Training credit in excess of 12 months will not be granted in this category.

If provision has been made to study a single basic science such as pathology, physiology, or anatomy, up to six months credit may be granted for such study.

Credit may be granted for a maximum of 12 months spent in full-time surgical research under a responsible investigator who is acceptable to the Board. A candidate may not claim credit for both graduate study and research years.

(c) Further acceptable surgical residency or fellowship training, either in general surgery or in a recognized surgical specialty.

N.B.: Credit as outlined above under (a), (b), and (c) will be applicable only toward the two years of training which group 2 candidates must complete in addition to three years of approved residency in general surgery. It will not be considered as basic residency credit.

MILITARY CREDIT

Credit not to exceed one year may be granted to those candidates who have served in military hospitals other than those approved for residency training, provided that the candidate has had a satisfactory surgical assignment with adequate and diversified clinical material and provided further that his work in surgery is carried out under the supervision of a surgeon acceptable to the Board. Any such credit will be considered preceptorship credit toward group 2 requirements and not basic residency credit.

LICENSE TO PRACTICE

The Board requires, prior to issuence of a certificate, that candidates have a valid license to practice medicine except in those situations in the United States or Canada in which a license to practice is not required, such as the practice of surgery by commissioned officers in the Army, Navy, or Public Health Services of these countries.

REQUIREMENTS FOR FOREIGN BORN AND FOREIGN TRAINED CANDIDATES

Such candidates must meet the same requirements as citizens of the United States or Canada. The Examination Committee, however, after individual evaluation, may grant credit for foreign training.

APPLICATIONS

Prospective candidates for examination by the Board should carefully read the Board's requirements as set forth in this Booklet of Information. If, after becoming familiar with the requirements, a candidate needs advice about his training, or believes he has completed the requirements, he should submit a brief chronological outline of his training, including precise dates, using the Evaluation Form which will be furnished on request.

Application for Examination forms are not forwarded until candidates are within several months of completing their training requirements and appear to have met all other requirements of the Board.

Applications should be returned by August 1 if consideration is desired for examination in part 1 in December of the same year. Those desiring such consideration are urged to apply several months before completing their training requirements to enable the Board's office to process as many applications as possible before the August 1 registration deadline.

Candidates completing their training requirements after September 30 must await consideration for admission to the December part 1 examination one year later.

The Board's acceptance of candidates for examination is based not only upon an evaluation of their training, but also upon information available to the Board concerning their professional ability as surgeons and their ethical standing.

Candidates are notified of their eligibility for the part 1 examination when their applications have been approved, and subsequently are sent a list of examination centers from which to choose. Candidates are not eligible for the part 2 examinations until they have made a passing grade in part 1.

EXAMINATION

The qualifying examination is divided into part 1 (written) and part 2 (oral). In both of these a knowledge of the practical application of the sciences fundamental to surgery is required.

PART 1

The examination is given simultaneously in as many centers throughout the United States as the Board may determine suitable for the purpose and sometimes by special arrangement in certain centers abroad. It is held once annually on the first Wednesday of December.

The part 1 examination is of the objective, multiple-choice type, and is administered during a half-day session. This examination is designed to cover general surgical problems including the application of the sciences basic to surgery. Questions are of various types and are based upon the analysis of case histories, cause and effect relationships, and other pertinent situations. The examinations are composed by members of the Board with the technical assistance of the Educational Testing Service.

PART 2

Examinations usually are held in ten different centers in the United States each year from September to June inclusive. These examinations are conducted by members of the Board and selected diplomates acting as guest examiners.

The part 2 examination is oral and practical and requires the candidate's presence for one day. Candidates are examined in clinical surgery, including diagnosis, management of patients, and the application of anatomy, pathology, physiology, biochemistry, and bacteriology to surgical problems. In pathology, emphasis is placed on an understanding of disease processes and their clinical implications. The identification of gross and microscopic lesions and the interpretation of roentgenograms also may be included.

FEES

The fee for examination is $175.00 payable as follows: $25.00 for registration, $75.00 for part 1 and $75.00 for part 2.

The fee for reexamination in part 1 or in part 2 is $75.00.

The Board is a nonprofit organization. All fees will be used, after a reasonable amount is set aside for necessary expenses, to aid in improving existing opportunities for the training of surgeons. The members of the Board, except the Secretary-Treasurer, serve without remuneration.

CERTIFICATION IN THORACIC SURGERY

Diplomates of the American Board of Surgery wishing to become certified in thoracic surgery are advised to communicate with the Secretary of the Board of Thoracic Surgery, Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2. This Board is an affiliate of the American Board of Surgery.

BOARD OF THORACIC SURGERY

(An affiliate of the American Board of Surgery)

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Robert H. Wylie, New York
Wm. M. Tuttle, Secretary and Treasurer, 1151 Taylor Ave., Detroit 2.

REQUIREMENTS FOR EXAMINATION

1. Certification by the American Board of Surgery.
2. Two years training in thoracic surgery approved by the Board of Thoracic Surgery, or meritorious contributions to thoracic surgery. One of these two years may be spent during the four years of training in surgery required by the American Board of Surgery.
3. Written and oral examination.

Definition of what is considered acceptable training in Thoracic Surgery.—To qualify for the examination in thoracic surgery, the candidate shall have had two years of training in an active, well-integrated thoracic surgical clinic or clinics, or the equivalent amount of thoracic surgical training, on a mixed service consisting of thoracic and non-thoracic surgical cases. Adequate training in both the tuberculous and nontuberculous aspects of thoracic surgery is expected. In order to obtain this objective, combined residencies between institutions of different types may be advantageous. It is also required that the candidate be familiar with the basic sciences as related to thoracic surgery. Under exceptional circumstances certain surgeons may, by virtue of recognized proficiency in the surgical treatment of thoracic diseases, qualify for the examination at the discretion of the Board.

APPLICATIONS

Prospective candidates desiring to apply for examination should consider whether they are able to meet the minimum requirements of the Board. They should then submit a letter to the secretary's office, outlining briefly their training and experience in thoracic surgery and ask for an application form. An application form will not be sent unless evidence is submitted in the letter indicating that the prospective applicant appears to meet the minimum requirements.

EXAMINATIONS

The qualifying examinations are divided into two parts. Part 1 is written, and part 2 is an oral examination in clinical surgery, x-ray interpretation, and pathology.

Part 1.—This examination will be given simultaneously at least once a year in as many centers throughout the country as the Board may determine suitable for this purpose.

Part 2.—In order to be eligible for part 2 a candidate must have successfully completed part 1. Examinations in part 2 are conducted in certain centers of the country selected by the Board.

Candidates examined by the American Board of Surgery in part 1 (written examination) on or after October 26, 1955, who are certified by the American Board of Surgery, will be required to take only the oral examination given by the Board of Thoracic Surgery.

Candidates examined by the American Board of Surgery in part 1 prior to October 26, 1955 will be required to take part 1 (written examination) of the Board of Thoracic Surgery before taking its oral examination.

REEXAMINATIONS

Those individuals who fail part 1 or part 2 will be required to wait one year before they can retake the part which they failed. Those who fail twice will be required to wait for a period of two years. Candidates who are unsuccessful at three attempts will be required to wait three years before requesting reconsideration. The Board may at its discretion deny the candidate the privilege of reexamination.

Candidates declared eligible but who fail to exercise the examination privilege within three years of the date of filing the application will be required to file a new and current application and pay a new examination fee. Also a candidate who has failed in an examination (part 1 or part 2) and who does not apply for reexamination within three years shall be required to make a new application and pay a new examination fee.

FEES

For the special examination in thoracic surgery and the issuing of a certificate the fee will be $100.00. Fifteen dollars of this fee is to accompany the application and will be considered as a registration fee. It is nonreturnable to the applicant in case he is disapproved for examination.

The fee for reexamination will be $50.00.

AMERICAN BOARD OF UROLOGY

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William Niles Wishard Jr., Secretary-Treasurer, 30 Westwood Road, Minneapolis 26.
Mrs. Ruby L. Griggs, Executive-secretary, 30 Westwood Rd., Minneapolis 26.

REQUIREMENTS

A. Application for certification must be made on a special form. This will be provided by the secretary and must be returned to him accompanied by other required data and credentials and by $50 of the examination fee.

B. The applicant must have graduated from a medical school of the United States or Canada recognized by the Council on Medical Education and Hospitals of the American Medical Association and must have completed an internship of not less than one year in a hospital approved by the same council.

Requirements of graduates of foreign medical schools shall conform to and be similar to the requirements as demanded of the applicants for the accepted medical schools in the United States and Canada. Such applications will be considered by the full board on individual merits.

C. The applicant must establish in a manner satisfactory to this Board that he is a physician duly licensed by law to practice medicine and that he is of high ethical and professional standing.

D. The applicant must establish that he has received special graduate training as follows in this order:

1. An approved internship of at least one year.
2. One year in the basic sciences or clinical studies basic to urology, or one year residency in general surgery or internal medicine.
3. An approved graduated three-year residency in urology, leading to competency in all its phases.

E. Applicant must have an additional period of not less than two years in the practice of urology in the city of his office or place of practice.

F. The applicant must assure the Board that he is engaged in the full time practice of urology.

FEE

The examination fee is $150. Fifty dollars must accompany the application. One hundred dollars must be paid when the application has been processed. Neither fee is returnable.

Applications for certification shall be examined by the credentials committee and reviewed by the board. When additional data are required to complete the application, these will be requested by the secretary.

REQUIREMENTS FOR CERTIFICATION

The requirements for certification include evidence of hospital practice including the presentation of report of 25 representative (not necessarily consecutive) major urologic cases from practice, which must contain all items essential for diagnosis, therapy, prognosis, results of treatment, etc; a written examination; and pathology and oral clinical examinations.

A. Evidences of Hospital Practice and Case Reports: An index, in consecutive order, of all major and minor urologic surgery (including endoscopy) done during the last two years of practice must be presented. This index must be verified by the various hospital administrators.

The candidate must present 25 records of major urologic cases completed since the candidate's residency training with hospitals, names, (or initials) and record numbers in which the candidate has had complete charge, responsibility and activity in all phases of the patient's care. These reports must be typewritten on 8½-by-11-in. paper and in duplicate but need not be on any special form. Please file the duplicate in your own office. This second copy will be called for when and if it is needed.

Complete index lists must accompany the reports. If they are obtained from more than one hospital a separate index list of each group should be provided. These lists must state the operator's name at the head of each page, the name (or initials) of the patient, the hospital number, and the name and date of operation. Statements from the administrators of the hospitals attesting that the candidate was the operator must be included.

The applicant must personally prepare the case reports, remembering that they are documentary evidence of his ability and that the material in them and the manner of presentation are important evidences of his competence as an urologist.

The case reports must be received on or before September 1.

B. Written Examination: The written examination is designed to test the candidate's preparation in and his knowledge of the whole field of urology, including the subjects. clinical urology, pathology, anatomy, physiology, embryology, bacteriology, physiological chemistry, and endocrinology. These may be held on certain dates simultaneously in different parts of the country at places convenient for candidates.

C. Pathology: The examination in pathology will consist of the identification of gross specimens and of sections of tissue observed through the microscope. It will be held at the time of the oral examination.

D. Oral-Clinical Examination: This will consist of discussions of urologic problems. The subjects forming the basis of this examination are urography; diseases of the genital organs, including the prostate and each portion of the urinary tract and the adrenals. It will ascertain the candidate's familiarity with recent literature, the breadth of his clinical experience, and his general qualifications for practice of urology.

The professional adaptability of each candidate will be investigated in an attempt to determine his ethical conduct and his attitude toward his patients and fellow practitioners.

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NO SINGLE PANACEA FOR THE INTERNSHIP

GUEST EDITORIAL

Leland S. McKittrick, M.D.

AT THE recent meeting of the House of Delegates in San Francisco several resolutions were introduced which had as their objectives the supplying of certain hospital service functions through the means of interns. One resolution[1] suggested that since nonuniversity affiliated hospitals were experiencing difficulty in obtaining interns in requisite number and caliber, the problem might be solved by having the American Medical Association take appropriate measures to investigate the feasibility of the use of senior medical students to replace first-year interns in affiliated hospitals, thereby making such interns available for the nonaffiliated institutions. Another resolution[2] pointed up the critical shortage of interns in community and municipal hospitals and proposed that medical schools adopt a policy of encouraging a reasonable percentage of graduates to seek a two-year rotating internship in such institutions. A third[3] resolution indicated that the intern shortage interferes with the quality and the quantity of service provided for patients in voluntary and municipal hospitals. It also categorically stated that "the two-year rotating internship is the best foundation for the practice of medicine, for further training in a specialty, and/or for training in the armed forces," and resolved that the American Medical Association should recommend the two-year rotating internship.

Throughout each of these resolutions the thread of emphasis is placed on supplying interns to certain hospitals for the purpose of covering the service needs of these institutions. This problem has confronted the House of Delegates and the Council on Medical Education and Hospitals ever since it was recognized that a period of hospital education and training beyond graduation from medical school is an essential experience before entering general practice or undertaking further preparation for specialty practice. It is clearly recognized that *there is a need for augmentation in the number of* physicians in keeping with population growth and the development of new specialty fields. Unfortunately, however, the so-called intern-shortage has been repeatedly utilized by individuals and organizations as one of the evidences of inadequate numbers of medical graduates to the point where it has confused the real issues. Those who advocate intern needs as a measure of physician requirements fail to remember that at no time have more than 12 to 15% of the hospitals in the nation been approved for intern education and training. Furthermore, those who imply that good medical care exists only where there are internships and/or other forms of graduate medical education forget that 85% of our hospitals do not have such programs. Such programs are no guarantee of high quality medical care unless the medical staff of a hospital and the hospital administration are exerting every effort to maintain high standards of graduate medical education wherever they are being conducted. High quality medical care is a responsibility that lies directly with the physician whenever a patient is hospitalized, regardless of the presence or absence of an intern or resident education and training program within the institution.

An editorial from The Journal which appeared in August, 1920,[4] described "The Hospital Intern Problem" of that day in a manner that so nearly parallels the current scene that it merits full quotation, as follows:

> As noted in the previous comment, 593 of the 6,440 hospitals in the United States require annually 3,420 interns, or about 400 more than are turned out this year by the medical schools. Nevertheless, these hospitals represent a very small proportion of all hospitals in the country, and the number seeking interns is increasing. It can be seen, therefore, that the number of students graduating annually is not sufficient to supply interns for all hospitals seeking them, far less to meet the demand if all general hospitals should desire to use them. This, meanwhile, is one of the bases for the claim that there is a dearth of physicians. It can readily be seen, however, that sufficient interns could not be provided for all hospitals even if the annual number of graduates exceeded by several times the normal output for this country. The intern

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Chairman, Council on Medical Education and Hospitals.

[1] Resolution No. 10 on Use of Senior Medical Students as Clinical Clerks to Replace First Year Interns, introduced at San Francisco Session of House of Delegates of A. M. A., June, 1958

[2] Resolution No. 26 on Two-Year Rotating Internships in Community and Municipal Hospitals, introduced at San Francisco Session of House of Delegates of A .M. A., June, 1958.

[3] Resolution No. 27 on Plan to Promote Improved Intern Education and to Correct the Shortage of Interns, introduced at San Francisco Session of House of Delegates of A. M. A., June, 1958.

[4] The Hospital Intern Problem, Editorial, J. A. M. A. **75**:418 (Aug. 7) 1920.

[5] Approved Internships—Directory of Approved Internships and Residencies, compiled by Council on Medical Education and Hospitals of the A. M. A., J. A. M. A. **168**:529 (Oct. 4), 1958.

[6] Hospital Statistics, Hospitals **32**:352 (Aug. 1, pt. 2) 1958.

problem must be solved in some other way. Many hospitals, even now, are employing physicians as residents or house officers at increasing salaries or with gradually increasing privileges in the way of practice. Interns, also, should be relieved of much of the work required of them which should be done by orderlies employed for that purpose. History-writing and records, which have depended largely on intern service, can be kept up by staff physicians through the use of stenographers. It is certain that the increased demand for interns does not justify either the lowering of educational standards or a multiplication of medical schools.

Of the 6,946 hospitals in the United States today, only 867 have been approved by the Council on Medical Education and Hospitals[5] (see this issue, page 529) for internship education and training. In 1958 these institutions offered a total of 12,325 internship positions. During that year there were 6,861 graduates from approved medical schools in the United States. However, between graduates of these schools and graduates of foreign medical schools, 10,198 of the total approved internship positions were filled. Thus in the 6,946 hospitals[6] in the United States, territories, and possessions 867 or slightly over 12% offered internship training opportunities far in excess of the number of graduates of the medical schools. It is obvious from these figures that redistribution of interns, utilizing clinical clerks to replace interns in teaching institutions, or prolonging the internship to two years will not provide the type of panacea for supplying the extra pair of hands so keenly sought by many members of the medical profession and hospital administrators.

The whole area of medical education is undergoing transition in this rapidly changing and dynamic scene. The internship is just one facet of medical education which continues to be the focus of controversy, because its service aspects do involve medical care in those institutions where such programs have been developed. The next few years may see the disappearance of the internship in its traditional concept as further advances in keeping with knowledge and needs are made in the education of the physician. In the meantime we should not be deluded into the belief that there is some magic manipulation of the internship which can furnish the answer to meeting service functions which are the responsibility of the physician and the hospital administration when patients are admitted to hospitals for medical care.

ANNUAL REPORT AND DIRECTORY OF APPROVED INTERNSHIPS AND RESIDENCIES

The 32nd Annual Report on Internships and Residencies published in this issue of THE JOURNAL is based on a questionnaire issued one year ago to all hospitals with approved programs. Although these data apply to the year 1957-1958, they represent the situation on Sept. 1, 1957. The Directory of Approved Internships and Residencies contains data provided in the same questionnaire, but is an announcement of hospital programs available on July 1, 1959, for the year 1959-1960.

This 32nd Annual Report indicates that there was a modest increase in the number of approved internships and residencies offered on July 1, 1958, as compared with those announced for the previous year. The total number of hospitals now conducting approved programs has reached 1,400. Of this number, 10% (141) offer only intern training, 38% (537) offer only resident training, and 52% (722) offer both intern and resident training.

This annual report and directory serves two distinct groups of individuals. It is useful to the recent graduate in medicine who is planning his further graduate training program. It is of equal or greater use to training program directors and medical administrators dealing with broad aspects of graduate training and concerned with program trends and planning for the future.

The staff of the Council on Medical Education and Hospitals is now engaged in a study aimed at increasing the usefulness of the report and the directory. The standard questionnaire for the year 1958-1959 has been altered only to include a question on certification by the Educational Council for Foreign Medical Graduates. A supplemental questionnaire will also be used this year as a first step in this continuing study.

Among the subjects under study are a more thorough characterization of other areas of graduate training leading toward specialization such as fellowships, traineeships, and preceptorships; additional descriptive data on hospital training features such as percentage of private patients, average length of patient stay, average daily census of the individual specialty services, and the autopsy rate for each such service, and a more thorough study of the range of stipends in individual programs.

There will be a continuing effort to indicate combinations of training programs through the mechanism of the "indented listing." It may be possible to list the resident positions for each year of each program so that its vertical or pyramidal nature will be indicated.

There is now a functioning residency review committee for obstetrics and gynecology. Residency programs in pathology and thoracic surgery are still approved by concurrence of the Council and the Specialty Boards concerned. All other specialty programs as well as internships and general practice residencies are evaluated and approved by committees of leaders in each of the special fields of medicine.

While this report is prepared by the Council staff, it represents the combined efforts of the Review and Conference Committees, hospital administrators, medical educators, and the staff members of other national groups concerned with graduate medical education and training. The importance which this annual report will assume is related to the discrimination with which future questionnaire items are selected and the accuracy and completeness of the replies from hospital administrators.

ORGANIZATION SECTION

LETTER REGARDING CONFERENCES ON AGING

August 11, 1958

The Honorable Lister Hill, Chairman
Committee on Labor and Public Welfare
United States Senate
Washington 25, D. C.

Dear Senator Hill:

The American Medical Association is distressed to learn that your Committee has decided to indefinitely postpone further consideration of H. R. 9822, which provides for the holding of a White House Conference on Aging and to assist states in conducting similar conferences on aging prior to the White House Conference.

The American Medical Association has had a deep and longstanding interest in the problems of our aged citizens, especially in regard to their health needs. Our Committee on Aging, established in 1955, is composed of some of the leading medical authorities in the country on the health problems of older persons. This Committee has recently conducted regional conferences on aging in Seattle, Dallas, Philadelphia, Birmingham, and Omaha. The American Medical Association has also scheduled a national conference on aging to be held in Chicago on Sept. 12-14. Up to the present time, approximately 30 state medical societies have created Committees on Aging, and by September it is expected that approximately 40 such Committees will have been formed.

In addition to the activities of its Committee on Aging, the American Medical Association has recently joined with the American Dental Association, the American Hospital Association and the American Nursing Home Association in establishing a Joint Council to Improve the Health Care of the Aged. Although studies of the problems of the aged have been under way for the past several years by these various organizations, research in this field will now be intensified through joint efforts, and projects for meeting the problem will be activated as rapidly as possible.

The American Medical Association believes very strongly that there is a need for systematic interchange of ideas in this field. Through our experience with our regional conferences on aging and through our activities as a member of the Joint Council, we have learned that much is to be gained from state and national conferences on this subject, such as proposed in H. R. 9822. The members of the medical profession will take part in these conferences, both on the state and national levels, to the fullest extent possible.

The purpose of this letter, therefore, is to request that you and your Committee reconsider your action and favorably report to the Senate H. R. 9822, as it passed the House.

Sincerely yours,
F. J. L. Blasingame, M.D.
Executive Vice-president.

CHANGES IN PERSONNEL AT HEADQUARTERS

Dr. M. Eleanor Blish of Houston, Texas, has been appointed a member of the field staff of the Council on Medical Education and Hospitals. Dr. Blish, who has been in the practice of pediatrics for many years, was also assistant clinical professor of pediatrics at Baylor University College of Medicine and assistant to the director of the Children's Clinic at the Houston Tuberculosis Hospital.

Mr. William Hetherington, Executive Publisher of *Today's Health*, who had been with the A. M. A. for 10 years, left headquarters Sept. 19 to accept a position with the *Reader's Digest*, with his headquarters in Chicago.

Mr. Richard Stalvey, who has been with the A. M. A. since 1954, first as an administrative assistant in the Bureau of Investigation and later in the Public Relations Department, has taken up his new duties as Assistant Executive Director of the Los Angeles County Medical Association.

RALPH CREER TO ATTEND JAPAN MEDICAL CONGRESS

Ralph Creer, director of motion pictures and medical television for the American Medical Association, is to go to Tokyo next April as a guest of the Japan Medical Congress. Mr. Creer will organize and direct an International Medical Film Exhibition as part of the Congress' 15th General Assembly. He also will deliver several illustrated lectures to the faculty of the two medical schools in Japan.

COUNCIL ON MEDICAL SERVICE

CURTAILMENT OF MEDICARE PROGRAM

The Sept. 27 issue of The Journal reported editorally that a new directive, drastically reducing the amount of care provided at government expense in civilian hospitals and by civilian physicians for uniformed services dependents, would go into effect Oct. 1, 1958. These are the basic changes, as outlined in ODMC (Office for Dependents' Medical Care) Letter No. 16-58.

Excluded Categories of Care

On and after Oct. 1, 1958, no civilian outpatient treatment of dependent spouses and children of uniformed service personnel on active duty will be eligible for payment, except when incident to maternity care. Services by civilian physicians and hospitals to servicemen's dependents will be eligible for payment only if the patient is hospitalized for treatment of an acute or emergency surgical or medical condition.

The following six categories of care are specifically excluded from payment: (1) treatment of injuries on an outpatient basis, (2) the termination visit of a referring physician, (3) outpatient presurgical and postsurgical tests and procedures, (4) neonatal visits on an outpatient basis, (5) treatment of acute emotional disorders (except when the patient is hospitalized for some other acute or emergency condition), and (6) elective surgery, which means any surgery which can be delayed and planned for subsequently without detriment to the patient.

Eligible Patients

Maternity care and the in-hospital treatment of acute and emergency surgical and medical conditions are the only categories of service for which payment to civilian physicians or hospitals is authorized. The right of the dependent spouse or child to choose between civilian and uniformed service facilities as a source of these services is further limited by whether the dependent is residing with or apart from his sponsor.

Dependent Residing Apart from Sponsor.—Eligible dependents who are residing apart from their sponsors may choose either civilian or military facilities as a source of care in the authorized categories. A statement to the effect that the dependent is residing apart from the sponsor entered on the claim form will be sufficient to justify payment for authorized care, "provided that the person or entity providing the care has no actual knowledge to the contrary."

Dependents Residing with Their Sponsors.—Dependents who are residing with their sponsors can obtain care at government expense only if they go to the appropriate government facility, unless the officer commanding that facility or his designee decides that he does not have adequate facilities or personnel available. In this case, the local command issues a permit for treatment by a civilian physician and admission to a nongovernmental hospital. The only care eligible for payment with this permit is maternity and acute or emergency in-hospital care.

Generally, care for dependents residing with their sponsors may be provided without a permit only when the dependent is on a trip away from the sponsor's household or in an acute emergency. In the first case, the claim form DA 1863 must contain the statement, "On trip." In the second, it must contain a statement by the attending physician that, "This is a bona fide acute emergency."

"Carry-Over" Patients

The directive does make temporary exceptions to some of these limitations on authorized civilian care in cases where treatment began before Oct. 1, 1958, but continues past that date. These patients are still eligible for categories of care eliminated by the directive: termination visits and outpatient presurgical and postsurgical tests and procedures associated with a hospitalization are payable if the hospital admission occurred prior to Oct. 1, 1958; neonatal outpatient visits are still authorized for births which occurred prior to that date; and outpatient visits for the treatment of injuries are reimbursable if the patient arranged for care before Oct. 1, 1958.

A temporary exception is also made for some dependents residing with their sponsors. If these dependents were admitted to a civilian hospital before Oct. 1, 1958, and their hospital stay resulting from this admission lasts beyond that date, no permit from the local command is necessary for the hospital stay. Also, if these patients were receiving authorized care from a civilian physician, no permit is necessary for continuance of that care during the hospital stay. In cases of this type, both the hospital and the physician claim form, DA 1863, must show the date of hospital admission.

Obstetric and Maternity Care

An exception is made for dependents residing with their sponsors who are receiving maternity care. If they are in the second or third trimester and were under the care of a civilian physician on or before Oct. 1, 1958, they may continue under the care of that physician without a permit, provided there is no change in duty station of the sponsor. In such cases both the physician and the hospital must attest that the patient was under his care and in the second or third trimester on or before Oct. 1.

It should be noted that this exception applies only to those in the second or third trimester. A patient in the first trimester on Oct. 1, who is residing with her sponsor, must obtain care from the government facility unless the commanding officer or his designee certifies that adequate personnel and facilities are not available and issues a permit for civilian care.

All these exceptions are merely temporary, and affect only those patients whose hospitalization (for termination visit and outpatient presurgical and postsurgical procedures), birth (for neonatal visits), second trimester (for maternity care), or injuries (for outpatient treatment) took place prior to the effective date, Oct. 1, 1958. Any of these events commencing after Oct. 1 will be governed by the new regulations.

Reporting Methods

For treatment of dependents residing apart from their sponsors, a certification to that effect by the dependent on the claim form is sufficient to justify payment for care in the authorized categories—maternity care and hospital treatment of acute and emergency surgical or medical conditions—"provided that the person or entity providing the care has no actual knowledge to the contrary."

Care for a dependent residing with a sponsor but away from the sponsor's household on a trip is also allowable on the basis of the statement "On Trip" in Item 3 or 4 of the claim form if the physician has no actual knowledge to the contrary. Emergency care by a civilian physician or hospital for a dependent residing with a sponsor is payable if the claim form included a statement by the attending physician that "This case was a bona fide acute emergency."

In these three types of cases, according to the directive, the physician's or the hospital's statement is considered sufficient evidence of the validity of the claim, if the treatment provided is authorized under the new regulations and the statement is made in good faith.

In the case of the temporary exceptions to the new regulations, described under "'Carry-Over' Patients" above, where the treatment provided involves hospitalization, all hospital claim forms must show that the patient was admitted before Oct. 1, 1958. Claims for neonatal visits must show that the infant was born prior to midnight Sept. 30, 1958. Claims for outpatient treatment of injuries must show that the patient arranged for treatment prior to Oct. 1, 1958. Claims for maternity-care of a dependent residing with her sponsor must show that the patient was in the second or third trimester and under the care of a civilian physician on or before Oct. 1 and both the physician and hospital must attest to these two facts.

For all dependents residing with their sponsors not covered by these temporary exceptions, a permit signed by the appropriate commander must be attached to the original copy of DA Form 1863 on claims submitted by attending physicians or hospitals. Claims submitted by others than the attending physician or hospital (such as assistant surgeons, radiologists, pathologists, consultants, physiatrists) will be authorized for payment without a permit. However, the forms initiated by them must state that a permit was furnished to the attending physician or hospital, and identify them by name.

Caused by Budget Pressure

The Department of Defense itself opposed the budgetary limitations that resulted in these restrictions and urged a continuation of the program as originally implemented. However, some elements within the Department desired increased utilization of military medical personnel and facilities and prevailed on the appropriations committees of Congress to encourage this by limiting the amount of money available to pay for civilian care. In fact, the first version of the appropriation measure passed by the House would have required even more stringent limitations on the civilian phase of the program. It cut the budget to 60 million dollars and included a section which prohibited supplemental appropriations or the use of other Department of Defense funds for payment to civilian physicians and hospitals. However, the House-Senate conference committee adopted, and both the House and Senate ratified, an amended version sponsored by Senator Knowland of California which raised the appropriation by 10 million dollars and placed less restrictions on requests for supplemental appropriations.

As a result, the budget for the current fiscal year (July 1, 1958, to June 30, 1959) is set at $70,246,000, but the Department of Defense was directed by the conference committee and Congress to initiate and enforce administrative regulations designed to achieve "optimum" utilization of uniformed services facilities and personnel. What is "optimum" is as yet undefined and is apparently left to the decision of the commanding officer of each facility.

Since expenditures during fiscal year 1958 totaled nearly 90 million dollars and anticipated costs for the current year (fiscal year 1959) would be even higher under the regulations in effect prior to Oct. 1, 1958, the Department of Defense announced it was forced to bring out its new directive on a "crash" basis. It has two stated objectives: to achieve greater economy and to encourage more use of government facilities. These ends the Department is attempting to attain, as has been noted, by eliminating authorization for a number of categories of care previously provided by civilian physicians and hospitals and by requiring those dependents who live with their sponsors to obtain care from government facilities unless the commanders of the facilities decide that they do not have adequate personnel or facilities available.

The claim that the increased emphasis on utilization of military facilities was an economy measure demanded by Congress seems somewhat questionable in view of the fact that the same session of Congress increased current Public Health Service appropriations over fiscal year 1958 by nearly 200 million dollars, an increase in federal health and medical expenditures almost three times as great as the total Medicare cost.

Limitations and Military Morale

The Department of Defense has stated its belief that continuation of the program on its first basis would be more conducive to high morale among members of the uniformed services. In fact, Public Law 569 states "The purpose of this Act is to create and maintain high morale throughout the uniformed services. . . ." The following comments on possible results of restrictions on civilian care are taken from the First Annual Report of the Office for Dependents' Medical Care on the Dependents' Medical Care Program (1 June 1958):

> A restriction of "free choice" would require dependents in restricted areas to apply for and receive special authority for civilian care and if not administered most wisely, could conceivably result in an extremely adverse morale reaction among troops. (page 5)
>
> Young women about to become mothers prefer one physician; they desire privacy; they like to discuss with their physician the type of anesthetic to be used; and they do not like long waiting periods. They feel that the civilian program offers a better opportunity for obtaining the personal attention which they prefer. (page 5)
>
> If a case is accepted for which payment is later denied, because the patient lived within a restricted area, that particular physician will be reluctant to accept future cases. The individual physician will reflect his reaction to the State Associations and this will inevitably result in strained relationships, if not actual cancellation of contracts. (page 6)
>
> Patients requiring (special types of) surgery, or medical care for some of the more rare diseases, could not receive this treatment in the great majority of the uniformed services medical installations; however, in order to obtain authorization for care by civilian physicians, the patient would have to undergo a diagnostic study by service physicians. Obviously, this would be time consuming, wasteful, and costly. (page 6)
>
> There is no known comparison of costs, between uniformed service and civilian facilities, for medical care of young women and children. In fact, over-all comparison is most difficult because of the differences in organization and mission. The loss of dependent patients in uniformed services facilities is largely accounted for by maternity cases and it is in this area that service facilities were overcrowded prior to Medicare. (page 5)

This last comment is adequately supported by comparative data from the same Report (page 78) for the eight-month periods from January through August, 1956 (before Medicare) and January through August, 1957. In the 1957 sample period, the average daily patient load of dependents in military hospitals was 801 less than in 1956; almost three-fourths of the drop, 573 patients, occurred in the obstetric and gynecologic care category, which averaged 2,915 in 1956 and 2,342 in 1957. On the other hand, the category "Care other than OB-GYN" dropped only 228, from 3,961 in 1956 to 3,733 in 1957.

But while the dependent load in military hospitals had dropped only 801 in 1957, over 4,500 dependents received care daily in civilian hospitals under Medicare during this period. The total average daily patient load of servicemen's dependents receiving hospital care under federal auspices had increased over 3,700. In view of the comparatively small decrease in utilization of government facilities, especially in nonmaternity cases, and the 50% increase in the number of dependents receiving care in Medicare's first year, it appears open to question whether the present drastic reduction in civilian care will provide sufficiently improved utilization of military facilities to offset the probable effect on servicemen's morale.

Future of Medicare

Until the new regulations are in effect for some time, data will be insufficient for any analysis of their over-all effect. It seems likely, however, that the restrictions will be felt most in those states with a large number of military establishments, where the limitation of free choice for dependents living with their sponsors may result in a definite curtailment of civilian care. The results, therefore, will probably be felt most in the South Atlantic States, which had 21.9% of the hospital claims and 21.6% of the physician claims during the first year of the program's operation; in the Pacific States, which had 16.5% of the hospital and 21.9% of the physician claims; and in the West South Central States, which had 16.7% of the hospital and 15.4% of the physician claims. The foregoing percentages refer to the number of hospital and physician claims rather than the dollar amount. The six states in which the largest amounts were paid out in physicians' claims from Dec. 7, 1956, to Dec. 30, 1957, were California, Texas, Florida, Virginia, North Carolina, and Georgia.

The Board of Trustees of the American Medical Association has transferred responsibility in regard to the Medicare program from its special task force to the Council on Medical Service, which will keep track of developments in the program, confer with the ODMC when such action is indicated, and inform the profession concerning changes. On Monday, Dec. 1, 1958, the day prior to the opening of the Clinical Session, the Council's Committee on Federal Medical Services will sponsor a one-day conference on federal medical activities at Minneapolis. The afternoon session will be devoted to a discussion of current and possible future Medicare activities.

MEDICAL NEWS

ARKANSAS

Four Cases of Spotted Fever.—According to the Morbidity and Mortality Weekly Report of the U. S. Public Health Service for Sept. 5, Dr. Arthur M. Washburn, Arkansas State Board of Health, has reported on four cases of Rocky Mountain spotted fever, all of which occurred in members of one family residing in a county in which no cases of this disease have been reported for at least 10 years. This family lives in a rural wooded area and all four persons had numerous tick exposures. All of the illnesses yielded to treatment, but the fading rash was still evident on extremities four weeks after onset.

CALIFORNIA

Symposium on Viruses.—The Kaiser Foundation Hospitals in Northern California will present the second annual symposium on Viruses and Viral Disease Oct. 10-11 in the Fairmont Hotel, San Francisco. At the first session Wendell M. Stanley, Ph.D., will present "Newer Developments in Basic Virology" and Dr. Edwin H. Lennette will give "Laboratory Diagnosis of Viral Disease." The Oct. 11 program lists the following topics:

The Nature of Viruses, Robert C. Williams, Ph.D., Berkeley.
Respiratory Viruses of Clinical Importance, Dr. James O. Culver, Berkeley.
Enteric Viruses, Dr. Gilbert J. Dalldorf, New York City.
Interactions Between Tumor Viruses and Animal Cells, Harry Rubin, D.V.M., Pasadena.
Chemotherapy of Viral Disease, Dr. Aaron F. Rasmussen Jr., Los Angeles.
Present Status of Vaccination Against Poliomyelitis with Killed and Live Virus Vaccines and a Combination of the Two, Dr. Albert B. Sabin, Cincinnati, Ohio.

The symposium will conclude with a panel discussion "Viral Disease of the Central Nervous System," moderated by Dr. Edward B. Shaw. For information write Kaiser Foundation Hospital, Broadway and MacArthur, Oakland 11, Calif.

FLORIDA

Seminar on Premature Infants.—The University of Miami School of Medicine, Coral Gables, and the Florida State Board of Health will hold a five-day Seminar on Care of Premature Infants at the Premature Demonstration Center, Jackson Memorial Hospital, Miami, Nov. 17-21. The seminar, open to physicians and nurses, will provide demonstrations of equipment and their use, discussion of feeding, skin care, infections, and home care of prematures. Newer developments in the prevention of infection in nurseries will be included. The American Academy of General Practice will accord 35 hours credit in category I for those registering. Dr. Robert B. Lawson, chairman, department of pediatrics, and Dr. Demetrius G. Traggis, assistant professor of pediatrics, University of Miami School of Medicine, are in charge of the seminar.

ILLINOIS

Chicago

Dr. Coller to Give Phemister Lecture.—The Dallas B. Phemister Lecture will be presented this year at the University of Chicago Clinics by Dr. Frederick A. Coller, professor emeritus of surgery, University of Michigan, Ann Arbor, on "Surgery and Science." The lecture will be held on Oct. 7, 8:00 p. m., in Lecture Hall P-117 at Billings Hospital, 950 E. 59th St.

Sam Pearlman Honored.—Dr. Samuel J. Pearlman will be feted by Chicago doctors at a banquet in his honor at the Morrison Hotel Oct. 8. Dr. Pearlman, who will be honored for his "service to the medical profession" during a lifetime of practice in Chicago, is senior attending surgeon at Michael Reese Hospital, attending surgeon at Cook County Hospital and chairman of its ear nose and throat department.

MARYLAND

General Practice Meeting in Hagerstown.—The 10th annual meeting of the Maryland Academy of General Practice will be held Oct. 11-12 at the Hotel Alexander, Hagerstown. Eight hours of category I credit will be given for attendance. Papers to be presented by out-of-state speakers include the following:

The Irritable Child, Dr. Elwood K. Hammond, Paoli, Ind.
Diagnostic Aids and Management of Office Problems in Otolaryngology, Dr. Peter A. Pastore, Richmond, Va.
The Irritable Bowel Syndrome, Dr. Frederick Steigmann, Chicago.
Some Observations on Headache, Dr. Arnold P. Friedman, New York City.
Routine Rectal Examination, Dr. Walter H. Gerwig, Washington, D. C.
The G. P. and the Care of the Discharged Mental Patient, Dr. Else B. Kris, New York City.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

The annual banquet will be held Oct. 11, 7:30 p. m., and the cost for wives and guests will be $7. For information write the Maryland Academy of General Practice, 3722 Greenmount Ave., Baltimore 18.

NEW JERSEY

Conference on Child Amputees.—The biannual Congenital Child Amputee Conference and Clinic will take place at the Kessler Institute for Rehabilitation, West Orange, Oct. 18. The morning program will consist of an educational and orientation session. Dr. Henry H. Kessler, medical director of the institute, will discuss "Congenital Malformations and General Principles of Rehabilitation of the Congenital Amputee." The program will include documentary films on rehabilitation procedures employed in specific cases. Clinical examinations will be held in the afternoon. This free diagnostic service is available to congenital amputee children through medical referral. This conference is open to physicians, nurses, limb makers, therapists, and other rehabilitation personnel without charge. Advance registration is requested with Mrs. Lucile Gould, Kessler Institute for Rehabilitation, West Orange, N. J.

NEW MEXICO

Regional Physicians Meet in Santa Fe.—A regional meeting of the American College of Physicians for New Mexico will be held Oct. 11 at the Museum of International Folkart, Santa Fe. Dr. Robert Friedenberg, governor for New Mexico, and the following speakers, among others, are on the program:

Are Former Methods of Tuberculosis Treatment Obsolete?, Dr. Bela Szigeti, Fort Stanton.
Coronary Heart Disease in the Navajo: A Preliminary Report, Drs. Richard B. Streeper, Cecil H. Dillingham, Robert U. Massey, and Gordon F. Liu, Albuquerque.
Parathyroid Adenoma: A Case Report with Suggestions as to Management, Drs. Richard M. Angle and Robert C. Derbyshire, Santa Fe.
The General Hospital and the Acute Psychiatric Patient, Dr. Rudolph Kieve, Santa Fe.
Primary Rhabdomyosarcoma of the Heart, Dr. J. Robert S. Grier, Los Alamos.
Problems of the Identification of Aging, Dr. Edwin R. Ballinger, Los Alamos.
Fluorometric Steroid Determination in Plasma, Dr. Harry D. Ellis, Santa Fe.
The Use of the Large Liquid Scintillation Counter in Biological Research, Wright Langham, Ph.D., Los Alamos.
Clinical Applications of the Large Liquid Scintillation Wellcounter, Dr. Clarence C. Lushbaugh, Los Alamos.

Dr. Howard Wakefield, Chicago, regent, will give "Poignant Activities of the College" at the dinner meeting. The New Mexico Society of Internal Medicine will meet at 5:15 p. m., Oct. 11, and a tour of the Los Alamos medical facilities will be provided Oct. 12. For information write Dr. Heinz R. Landmann, P. O. Box 2033, Santa Fe, N. M.

NEW YORK

Symposium on Cinefluorography.—The first annual Symposium on Cinefluorography, sponsored by the department of radiology, University of Rochester School of Medicine and Dentistry, will be held Nov. 14-15 (just prior to annual meeting of the Radiologic Society of North America, which begins Nov. 16) at the Strong Memorial Hospital, Rochester. A discussion of cinefluorographic equipment and technique, appraisal of image intensification apparatus, film emulsions and film sizes, processing, viewing and interpretation, and radiation dose problems is scheduled for Nov. 14. Clinical application with detailed consideration of a major organ system will be discussed Nov. 15. The general cochairmen for the symposium are Dr. George H. Ramsey and Dr. James S. Watson Jr. Address all inquiries to Dr. George H. Ramsey, Department of Radiology, Strong Memorial Hospital, Rochester 20, N. Y.

New York City

Dr. Lempert Receives Surgeons Award.—At the Northeastern Sectional Meeting of the International College of Surgeons the Edwin and Hanna Speidel award was presented to Dr. Julius Lempert, research professor of otolaryngology, Tufts College Medical School, Boston. The plaque bears the seal of the International College of Surgeons and the words: "The Edwin and Hanna Speidel Award presented to Julius Lempert, M.D., F. I. C. S., for pioneering surgery for middle ear deafness of otosclerotic origin, International College of Surgeons, Northeastern Sectional Meeting, July 4, 1958, Manchester, Vermont."

OREGON

General Practice Meeting in Portland.—The Oregon Academy of General Practice will hold its annual scientific session Oct. 16-17 at the Multnomah Hotel, Portland. Papers by out-of-state speakers are as follows:

Treatment of Breast Diseases: Some Controversial Issues, Dr. John Armes Gius, Iowa City.
Lupus Erythematosis, Dr. Abou D. Pollack, Baltimore.
How to Be Sick Successfully, Dr. Thomas H. Holmes, Seattle.
Exercise Electrocardiogram as an Office Procedure, Dr. E. Gray Dimond, Kansas City, Kan.

On Oct. 16 Dr. Bertram L. Trelstad, Salem, president of the Oregon academy, will present "Treatment of Plantar Warts and Keratosis," and Dr. John G. Walsh, Sacramento, Calif., will speak at the luncheon on "Proper Relationship Between Medical Profession and the Third Party." On Oct. 17 a luncheon panel discussion will be moderated by Dr. Robert L. Mighell. "The Future of General Practice" will be discussed by Dr. Fred MacD. Richardson, Philadelphia, at the annual banquet Oct. 16, 7:30 p. m. For information write the Oregon Academy of

General Practice, 4942 N. E. 34th, Portland, Ore. Ten hours category I credit will be granted for attendance. Registration fee for nonmembers is $5.

PENNSYLVANIA

Mortality Among Centenarians.—Seventy-five persons over the age of 100 died in Pennsylvania last year, according to a report issued by the Pennsylvania Department of Health. Fifty-three of this group were females. One man and one woman were 111 years old. "This is the first tabulation of deaths in this age bracket ever attempted by the department," said Dr. Charles L. Wilbar, secretary of health.

Philadelphia

Alumni-Senior Class Dinner.—The Medical Alumni-Faculty-Senior Class Dinner of the University of Pennsylvania will be held Oct. 16, 6:00 p. m., at the University Museum, 33rd and Spruce Streets, Philadelphia. Dr. Alan Rubin, department of obstetrics and gynecology, University Hospital, is chairman.

Conference on Schizophrenia.—A two-day Conference on Schizophrenia and the Family will be held by the department of psychiatry, Temple University Medical Center Oct. 9-10 at the university Medical School Auditorium. Speakers will include Dr. Nathan W. Ackerman, New York City; Dr. Stephen Fleck, New Haven, Conn.; Gregory Bateson, Palo Alto, Calif.; Dr. Lucius Bowen, Bethesda, Md.; and Dr. John N. Rosen, Philadelphia. Panel discussions will follow each presentation. Dr. Oliver S. English, head, department of psychiatry, Temple University Medical Center, will open the conference. Fee will be $10.

Personal.—Dr. William C. Yakovac has been appointed pathologist to The Children's Hospital of Philadelphia, succeeding Dr. Bernard M. Wagner, who has resigned to accept appointment to the Robert L. King Chair for Cardiovascular Research in the department of pathology, University of Washington School of Medicine, Seattle.——The Metabolic and Arthritic Diseases Division of the National Institutes of Health has awarded Dr. Joseph N. Seitchik, clinical professor of obstetrics and gynecology, Hahnemann Medical College, a grant of $36,000 for research into the reasons for premature labor and the possible development of preventive measures.

SOUTH DAKOTA

Annual Seminar and Pheasant Hunt.—The Huron District's fourth annual pheasant seminar will be held Oct. 18-19 and all physician-hunters are invited. The program is as follows:

Oct. 18
9 a. m.—Registration at St. John's Hospital Auditorium, Huron.
9:30-11 a. m.—Dr. Edmund C. Burke, Rochester, Minn., "Nephritis in Childhood, Criteria for Diagnosis and Prognosis." Dr. William T. Smith, Minneapolis, "Our Old Friend Pruritis Ani."
12 Noon—Pheasant season begins (bag limit of male pheasants—4).
8 p. m.—Football Game: Huron College vs. Black Hills Teachers.
Oct. 19
9:30-11 a. m.—Dr. Raymond W. Healy, North Miami Beach, Fla., "Physical Medicine and Rehabilitation." Dr. Frederick J. Fischer, Detroit, "Common Orthopedic Problems."
12 Noon—Hunting.
8 p. m.—Stag for Registrants at Huron Country Club.

The registration fee ($10) will cover program, ball game, and the stag buffet. Room reservations can be made through the Huron Chamber of Commerce. Pheasant Seminar Committee Chairman is Dr. David J. Buchanan, 707 Dakota St., Huron, S. D.

WEST VIRGINIA

Heart Association Meeting in Fairmont.—The annual meeting of the Scientific Assembly of the West Virginia Heart Association will be held at the Fairmont Hotel, Fairmont, Oct. 10. Dr. William F. Richmond, of Beckley, chairman of the program committee, has announced the following program:

Pulmonary Physiology, Dr. Edward A. Gaensler, Boston.
Pulmonary Pathology, Dr. Peter P. Ladewig, Montgomery, W. Va.
General Principles of Treatment, Dr. Sol Katz, Washington, D. C.
Problems in West Virginia, Drs. Albert D. Kistin, Beckley, and William C. Stewart, Charleston.

Dr. Upshur Higginbotham, of Bluefield, is president of the scientific assembly. For information write the West Virginia State Medical Association, Box 1031, Charleston 24, W. Va.

GENERAL

North Central Medical Conference in Minneapolis.—The annual meeting of the North Central Medical Conference for the six-state area of Iowa, Minnesota, Nebraska, North Dakota, South Dakota, and Wisconsin will be held Oct. 11-12 at the Hotel Leamington, Minneapolis. The presidential address will be given by Dr. Arthur A. Lampert, Rapid City, S. D., at the dinner session after which Dr. F. J. L. Blasingame, Chicago, Executive Vice-President of the A. M. A., will speak on "Re-Organization of the American Medical Association." A discussion on "Cultism and Limited Licensees" will feature the following:

Reflexologists, John Zimmer, Sioux Falls, S. D.
Chiropractors, Robert B. Throckmorton, Des Moines, Iowa.
Osteopaths, Dr. Horatio B. Sweetser, Minneapolis.
Optometrists, Dr. Milton E. Nugent, Bismarck, N. D.
Psychologists, Dr. Edward D. Schwade, Milwaukee.

Other topics include "The Doctor and the Nursing Home," "Trends in Utilization of Prepaid Medical Care Plans," and "Third Party Medicine." For information write the Minnesota State Medical Association, 496 Lowry Medical Arts Building, St. Paul 2, Minn.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Sept. 6, 1958 Paralytic Type	Sept. 6, 1958 Total Cases	Sept. 7, 1957 Total
New England States			
Maine	..	..	1
New Hampshire	..	..	..
Vermont	..	..	1
Massachusetts	1	1	1
Rhode Island	..	..	..
Connecticut	1	2	3
Middle Atlantic States			
New York	12	13	12
New Jersey	11	24	9
Pennsylvania	7	7	..
East North Central States			
Ohio	6	18	10
Indiana	5	8	4
Illinois	4	26	32
Michigan	24	71	25
Wisconsin	1	1	16
West North Central States			
Minnesota	..	..	4
Iowa	4	12	7
Missouri	3	6	8
North Dakota	3	4	..
South Dakota	..	..	..
Nebraska	..	1	5
Kansas	..	1	4
South Atlantic States			
Delaware	..	1	..
Maryland	2	2	..
District of Columbia	..	..	7
Virginia	12	14	5
West Virginia	10	16	1
North Carolina	..	2	3
South Carolina	..	1	3
Georgia	1	8	2
Florida	3	7	7
East South Central States			
Kentucky	1	1	3
Tennessee	1	9	3
Alabama	..	1	..
Mississippi	2	3	2
West South Central States			
Arkansas	1	1	1
Louisiana	1	1	3
Oklahoma	3	3	8
Texas	22	29	22
Mountain States			
Montana	..	..	1
Idaho	..	2	1
Wyoming	..	1	1
Colorado	..	1	2
New Mexico	..	1	2
Arizona	1	1	..
Utah	..	..	3
Nevada	..	..	..
Pacific States			
Washington	..	1	2
Oregon	1	2	1
California	10	14	16
Alaska	..	..	1
Hawaii	2	2	2
Puerto Rico	..	..	4
Total	155	319	248

Medical Illustrators Meet in Dallas.—The annual meeting of the Association of Medical Illustrators will be held Oct. 6-8 in Dallas, Texas, with headquarters at the Adolphus Hotel. Following an address by Dr. Atticus J. Gill, dean, University of Texas Southwestern Medical School, a discussion of "Medical Illustration from the Standpoint of the Research Physician" will be presented by Drs. Carleton B. Chapman and Hugh E. Wilson. The discussion will be continued Oct. 7, 2:30 p. m., with Drs. Arthur Grollman, Charles L. Martin, and Curtice Rosser participating. The Brodel Memorial Lecture will be given by Dr. Milford O. Rouse at the annual banquet Oct. 6, 7:30 p. m., following "The Creation of Images," by Mr. Lewis Waters, president of the association and chairman, department of medical art, University of Texas Southwestern Medical School. Thomas G. Hull, Ph.D., director of scientific exhibits, American Medical Association, will present "Effective Presentation of the Scientific Research Exhibit" the afternoon of Oct. 8. A tour through the medical art department at the university is planned. For information write the Department of Medical Art, University of Texas Southwestern Medical School, 5323 Harry Hines Blvd., Dallas 19, Texas.

Ophthalmology and Otolaryngology Meeting in Chicago.—The 63rd annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held Oct. 12-17 at the Palmer House, Chicago. Guest of honor will be Dr. Louis H. Clerf, professor emeritus of laryngology and bronchoesophagology, Jefferson Medical College, Philadelphia. The 15th Jackson Memorial Lecture will be given by Dr. Arthur Linksz on "Aniseikonia: With Notes on the Jackson-Lancaster Controversy," and the 14th Wherry Memorial Lecture will be given by Dr. Julius Lempert, Boston, on "Basic Principles Used in the Development of Modern Temporal Bone Surgery Technique." A symposium, "The Care of the Surgery Patient," will include the following by invited guests:

The Preoperative Evaluation of the Patient, Dr. H. Walter Jones Jr., Boston.
Some Fallacies in Choice of Anesthetic Agents, Dr. William K. Hamilton, Iowa City.
Postoperative Surgical Care, Dr. Alton Ochsner, New Orleans.

Foreign participants will include Dr. Teodulo Manuel Agundis, Mexico City; Dr. Enrique Malbran, Buenos Aires, Argentina; and Dr. G. Meyer-Schwickerath, Bonn, West Germany. Motion pictures, exhibits, and alumni dinners are planned. A ladies' program is arranged, and the annual banquet will be held 7 p. m., Oct. 13. Registration fee for nonmembers is $5. For information write Dr. William L. Benedict, Secretary, The American Academy of Ophthalmology and Otolaryngology, 100 First Avenue Building, Rochester, Minn.

Surgeons' Clinical Congress in Chicago.—The annual Clinical Congress of the American College of Surgeons will be held in Chicago, Oct. 6-10 with headquarters at The Conrad Hilton. Dr. Robert L. Schmitz, Chicago, assistant professor of surgery, Stritch School of Medicine of Loyola University, is chairman of the local advisory committee on arrangements. Major addresses will be made by Dr. Newell W. Philpott, Montreal, incoming president of the college; Dr. George J. Curry, Flint, Mich.; and Dr. Gunnar Thorsén, Stockholm, Sweden. Continuing the medical student education program launched by the college two years ago, 37 medical students will attend this congress as guests of the college (students are selected by vote of their classmates and medical colleges sending representatives are rotated each year). About 200 reports on research in surgical progress and surgery of the future will be made by researchers in the Forum on Fundamental Surgical Problems. Dr. Walter W. Carroll, Northwestern University, and Dr. J. Garrott Allen, University of Chicago, are in charge of the televised program of operations emanating from Passavant Memorial Hospital in Chicago, and Dr. Hilger P. Jenkins, Chicago, is in charge of the medical motion picture program. Dr. Harris B. Shumacker Jr., Indianapolis, supervises the program of research reports.

Annual Meeting of Rhinologic Society.—The fourth annual meeting of the American Rhinologic Society will be held Oct. 17-18 in the Palmer House, Chicago, under the presidency of Dr. Russell I. Williams, of Cheyenne, Wyo. Among the topics to be discussed will be pulmonary and nasal physiology, laboratory and clinical aspects of bone transplants, hump removal, roof repair, and nasal process corrections. The preliminary program includes the following:

Maxillary and Premaxillary Approach to Septal Surgery, Dr. Ralph H. Riggs, Shreveport, La.
Olfactory Factors in Experimental Neurosis in Animals, Dr. Jules H. Masserman, Chicago.
Second Golden Decade of Rhinologic Surgery—The Advances of the Past 10 Years, Dr. Harvey C. Gunderson, Toledo, Ohio.
Physiology of Respiration, Dr. David W. Cugell, Chicago.
Concepts of Nasal Physiology as Related to Corrective Nasal Surgery, Dr. Maurice H. Cottle, Chicago.
Bone Transplants; Experimental and Clinical Aspects, Dr. Robert D. Ray, Chicago.
Nasal Physiology, Dr. Irving Cramer, Cleveland.

"Hump Removal, Roof Repair, Nasal Process Corrections" will be the subject of a panel discussion, with Dr. Walter E. Loch, of Baltimore, as moderator. Dr. Guy L. Boyden, professor of otolaryngology, University of Oregon Medical School, Portland, will be the guest of honor. There is no registration fee. For information write Dr. Robert M. Hansen, 1735 N. Wheeler Ave., Portland 17, Ore., Secretary.

EXAMINATIONS AND LICENSURE

EDUCATIONAL COUNCIL FOR FOREIGN MEDICAL GRADUATES, INC.

Educational Council for Foreign Medical Graduates, Inc.: The American medical qualification examination to be given henceforth twice a year for foreign medical graduates. Medical Schools in the United States and Foreign Countries, Sept. 23. Final date for filing application was June 23. Dates for the 1959 examinations have been set for Feb. 17 and Sept. 22. Executive Director, Dr. Dean F. Smiley, 1710 Orrington Ave., Evanston, Illinois.

BOARDS OF MEDICAL EXAMINERS

Alaska:* On application in Anchorage and Juneau. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

California: *Written Examination.* Sacramento, Oct. 20-23. *Oral Examination.* San Francisco, November 15. *Oral and Clinical Examination for Foreign Medical School Graduates.* San Francisco, June 15; Los Angeles, August 17; San Francisco, November 16. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

Colorado: *Endorsement.* Denver, Oct. 14. *Written.* Denver, Dec. 9-10. Exec. Sec., Mrs. Beulah H. Hudgens, 715 Republic Bldg., Denver 2.

Guam: *Subject to Call.* Act. Sec., Dr. F. L. Conklin, Agana.

Maine: *Examination and Reciprocity.* Portland, Nov. 12-14. Sec., Dr. Adam P. Leighton, 142 High St., Portland.

Montana: *Examination and Reciprocity.* Helena, Oct. 7. Sec., Dr. Thomas L. Hawkins, 555 Fuller Ave., Helena.

New Mexico:* *Examination and Reciprocity.* Santa Fe, Nov. 17-18. Sec., Dr. R. C. Derbyshire, 227 East Palace Ave., Santa Fe.

Ohio: *Examination.* Columbus, Dec. 16-18. *Endorsement.* Columbus, August 18; October 6 and Dec. 16-18. Sec., Dr. H. M. Platter, Wyandotte Bldg., Columbus 15.

South Carolina: *Endorsement.* Columbia, Dec. 9. Sec., Dr. H. E. Jervey, Jr., Blanding Bldg., Columbia.

Texas:* *Examination and Reciprocity.* Fort Worth, Dec. 4-6. Sec., Dr. M. H. Crabb, 1714 Medical Arts Building, Fort Worth 2.

Wisconsin: *Reciprocity.* Madison, Oct. 16-18. Sec., Dr. Wm. H. Barber, 621 Ransom St., Ripon.

Wyoming: *Examination and Reciprocity.* Cheyenne, Oct. 6. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Alaska: *Examination.* Juneau, Nov. 4. Sec., Dr. R. Harrison Leer, Room 204, Alaska Office Bldg., Juneau.

Arkansas: *Examination.* Little Rock, Oct. 6-7. Sec., Dr. S. C. Dellinger, Zoology Department, University of Arkansas, Fayetteville.

District of Columbia: *Reciprocity. Examination.* Washington, Nov. 13-14. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave., N. W., Washington 6.

Kansas: *Examination and Reciprocity.* Kansas City, Nov. 24-25. Sec., Dr. L. C. Heckert, Pittsburg.

Michigan: *Examination.* Ann Arbor and Detroit, Oct. 10-11. Sec., Mrs. Anne Baker, 116 Stevens T. Mason Bldg., W. Michigan Ave., Lansing 15.

Texas: *Examination.* Oct. 13-14. Certificates issued by reciprocity and waiver on the first and fifteenth of each month. Sec., Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

Wisconsin: *Examination.* Milwaukee, Dec. 6. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

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*Basic Science Certificate required.

mation write the Minnesota State Medical Association, 496 Lowry Medical Arts Building, St. Paul 2, Minn.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories and possessions in the weeks ended as indicated:

Area	Sept. 6, 1958 Paralytic Type	Sept. 6, 1958 Total Cases	Sept. 7, 1957 Total
New England States			
Maine	..	..	1
New Hampshire	..	..	..
Vermont	..	..	1
Massachusetts	1	1	1
Rhode Island	..	..	..
Connecticut	1	2	3
Middle Atlantic States			
New York	12	13	12
New Jersey	11		
Pennsylvania			
East North			

River Township Hos[illegible]ood River, St. Joseph's Hospital, and the Alton Memorial Hospital, where he died Aug. 6, aged 69, of cardiovascular accident.

Blood, Wilkie Hooper Ⓜ Salt Lake City; Columbia University College of Physicians and Surgeons, New York City, 1917; associated with Latter-Day Saints Hospital; died Aug. 7, aged 73.

Burstein, Harry Ⓜ Kansas City, Mo.; University of Illinois College of Medicine, Chicago, 1932; service member of the American Medical Association; at one time served with the Indian Service; veteran of World War I; worked in the adjudication division of the Veterans Administration regional office; died Aug. 10, aged 60, of coronary thrombosis.

Cardinale, Pasquale F. Ⓜ Elizabeth, N. J.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1925; died near Browns Mills Aug. 11, aged 59.

Chandler, Ada B., Pardeeville, Wis.; Northwestern University Woman's Medical School, Chicago, 1895; died Aug. 3, aged 90, of pulmonary edema and left ventricular failure.

Clarke, Anna Calista, Scranton, Pa.; University of Michigan Homeopathic Medical School, Ann Arbor, 1890; served on the staff of the Hahnemann Hospital; an associate member of the American Medical Association; her achievements in the medical field won for her a "Distinguished Daughter of Pennsylvania" citation in 1954; died Aug. 19, aged 89.

Coover, Donald Bruce Ⓜ Littlestown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1917; veteran of World War I; died in the Annie M. Warner Hospital, Gettysburg, July 31, aged 65, of cancer of the lung.

Ⓜ Indicates Member of the American Medical Association.

Medical Illustrators Meet in Dallas.—The annual meeting of the Association of Medical Illustrators will be held Oct. 6-8 in Dallas, Texas, with headquarters at the Adolphus Hotel. Following an address by Dr. Atticus J. Gill, dean, University of Texas Southwestern Medical School, a discussion of "Medical Illustration from the Standpoint of the Research Physician" will be presented by Drs. Carleton B. Chapman and Hugh E. Wilson. The discussion will be continued Oct. 7, 2:30 p. m., with Drs. Arthur Grollman, Charles L. Martin, and Curtice Rosser participating. The Brodel Memorial Lecture will be given by Dr. Milford O. Rouse at the annual banquet Oct. 6, 7:30 p. m., following "The Creation of Images," by Mr. Lewis Waters, president of the association and chairman, department of medical art, University of Texas Southwestern Medical School. Thomas G. Hull, Ph.D., [illegible] scientific exhibits, American Medical

sion; died at his summer home in [illegible]tation of Aug. 1, aged 73.

Danell, Karl August Ⓜ Glendale, Ariz.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; also an ordained minister; member of the Illinois State Medical Society; at one time practiced in Chicago; died in the John C. Lincoln Hospital, Phoenix, Aug. 17, aged 92, of dissecting aneurysm and nephritis.

de Lappe, Guerne Wilson Ⓜ Modesto, Calif.; University of California School of Medicine, San Francisco, 1945; received the gold headed cane from his alma mater for distinguished academic achievement; served as president of the Stanislaus County Medical Society and the Stanislaus County Heart Association, of which he was founder; at one time served in the U. S. Naval Reserve; associated with Modesto City Hospital, Memorial Hospital, and Stanislaus County Hospital; died Aug. 8, aged 36, of a self-inflicted gunshot wound in the chest.

Denniston, Frank Ⓜ Fort Lauderdale, Fla.; Cornell University Medical College, New York City, 1909; past-president of the Broward County Medical Society; died in Hamburg, Germany, Aug. 18, aged 72.

Dillon, Carl Joseph Ⓜ Newark, Ohio; Starling Medical College, Columbus, 1907; past-president of the Licking County Medical Society; associated with the Newark Hospital, where he died July 30, aged 75.

Dolan, Paul Egan Ⓜ Livermore, Calif.; Oakland College of Medicine and Surgery, 1914; at one time city health officer; a member of the medical staff, University of California Radiation Laboratory; past-president of the Alameda County Fair Board and the Livermore Chamber of Commerce; founder of St. Paul's Hospital; died in Oakland, Aug. 10, aged 70.

Edelen, James Joseph, West Orange, N. J.; University of Maryland School of Medicine, Baltimore, 1911; an associate member of the American Medical Association; police surgeon of East Orange; on the staffs of the East Orange (N. J.) General Hospital and St. Mary's Hospital in Orange; died Aug. 5, aged 69, of coronary occlusion.

English, Martin Joseph Ⓜ Boston; born May 21, 1882; Harvard Medical School, Boston, 1907; served on the faculty of his alma mater and of Tufts College Medical School; professor emeritus of pediatrics at Boston University School of Medicine; veteran of World War I; school physician; in 1943 Holy Cross College in Worcester honored him by conferring the honorary degree of doctor of science; served as chief of pediatric services at Whidden Memorial Hospital in Everett, Mass., St. Elizabeth's and St. Margaret's hospitals, and the Boston City Hospital, where he was for many years member and past-president of the board of trustees, and where he died Aug. 8, aged 76.

Evans, William Powell, White Plains, N. Y.; Jefferson Medical College of Philadelphia, 1906; an associate member of the American Medical Association; veteran of World War I; consultant physician, St. Agnes Hospital, where he died Aug. 16, aged 75, of cancer of the stomach.

Falk, Alfred, Great Neck, N. Y.; Ludwig-Maximilians-Universität Medizinische Fakultät, München, Bavaria, Germany, 1901; an associate member of the American Medical Association; served on the staff of the New York Polyclinic Medical School and Hospital in New York City, North Shore Hospital, and the Manhasset Medical Center; died Aug. 17, aged 80, of an embolus of the abdominal aorta.

Fischer, Oscar Gustav, Berwyn, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the staff of St. Anthony's Hospital in Chicago; died Aug. 17, aged 77, of arteriosclerotic heart disease.

Fliedner, Giordano Bruno, Cleveland; Western Reserve University Medical Department, Cleveland, 1910; veteran of World War I; a long time member of the staff of Fairview Park Hospital; died Aug. 2, aged 71.

French, William Joseph, Annapolis, Md.; born Oct. 13, 1878; George Washington University School of Medicine, Washington, D. C., 1905; member of the Medical and Chirurgical Faculty of Maryland, World Health Organization, and the American Public Health Association; served as director of the Anne Arundel County Health Department and as health officer of Howard County; in 1918 went to France as a pediatrician for the American Red Cross and his medical work was recognized by the French government by the presentation of the Legion of Honor, Chevalier Grade, and the Reconnaissance Francaise; following his Paris assignment, served as director of the Delaware Child Welfare Committee; in 1923, the Commonwealth Fund of New York City appointed him director of its Child Health Demonstration in Fargo, N. D., where he remained for three years; in 1925 became director of the Commonwealth Fund in Austria, where his work won for him the Austrian Gold Medal of Honor; on his return he was named director of the division of public health of the Commonwealth Fund in New York City, holding this position until his resignation in March 1931; died in the Johns Hopkins Hospital, Baltimore, Aug. 3, aged 79.

Gardner, Charlotte Bell, Cumberland, Md.; Woman's Medical College of Pennsylvania, Philadelphia, 1899; an associate member of the American Medical Association; for many years secretary of the Allegany-Garrett Counties Medical Society; died in the Memorial Hospital Aug. 18, aged 86, of fracture of the hip, arteriosclerosis, and uremia.

Greenwald, Jesse, West Islip, N. Y.; New York Medical College, Flower and Fifth Avenue Hospitals, New York City, 1951; member of the Medical Society of the State of New York; certified by the National Board of Medical Examiners; interned at the Queens General Hospital in Jamaica and served a residency at the Goldwater Memorial Hospital in New York City; veteran of World War II; on the associate staff of the South Side Hospital in Bay Shore, where he died Aug. 4, aged 40, of myocardial infarction and acute cholecystitis.

Hardenbergh, Leroy Thorne Ⓜ Greenwood, N. Y.; Syracuse University College of Medicine, 1925; served as school examiner and health officer for many years; veteran of World War I; on the staffs of St. James Mercy and Bethesda hospitals in Hornell; died suddenly Aug. 8, aged 62, of arteriosclerotic heart disease.

Rubin, Lionel Charles, New York City; born in Boston Aug. 4, 1905; Harvard Medical School, Boston, 1930; member of the Medical Society of the State of New York and the American Academy of Dermatology and Syphilology; specialist certified by the American Board of Dermatology and Syphilology; associate clinical professor of dermatology and syphilology at New York University College of Medicine and New York Post-Graduate Medical School; veteran of World War II; associate attending dermatologist, dispensary service, New York Skin and Cancer Hospital; associate attending dermatologist and syphilologist, University Hospital (New York University-Bellevue Medical Center); consultant at the Veterans Administration Hospital; died Aug. 6, aged 53, of a heart attack.

FOREIGN LETTERS

BRAZIL

Ophthalmoscopic Examination During Pregnancy.—Dr. T. P. Nogueira (*Revista de gynecologia e d'obstetricia of Rio de Janeiro*, April, 1958) studied the eyegrounds in 300 pregnant women. Such an examination is especially important in the pregnant woman with hypertension. The prognosis is good for the patients who have no changes in the eyegrounds in spite of slightly elevated arterial pressure, edema of the legs, and albuminuria in the last three months of pregnancy. Usually these symptoms disappear with adequate treatment. About 62% of the pregnant women with hypertension had hypertensive retinosis and vascular disease prior to pregnancy. Stillbirth was more common in the group with hypertensive disease prior to pregnancy than in those who suffered from preeclampsia or uncomplicated eclampsia. Prematurity was more common in the hypertensive than in the normotensive group. Both the maternal and fetal prognosis were bad when the mother had hypertensive retinopathy.

Maternal Mortality.—In the May issue of the same journal, Dr. Fabio Goffi presented a study of maternal mortality based on data recorded in the São Paulo Health Department. In the last 20 years the maternal death rate in the county of São Paulo decreased significantly. The maternal mortality per 1,000 deliveries reached 5.8 in 1936 and dropped to 1.5 in 1955. The author suggested that (1) there should be greater accuracy of the medical data in the death certificates, (2) an autopsy be required when the cause of death is in doubt, (3) the welfare department instruct official and private agencies in the proper way to handle cases needing medical supervision and hospitalization, (4) the obstetrical training of doctors and auxiliary personnel be improved, (5) more maternity beds be provided, (6) health education concerning prenatal care be given to expectant mothers, (7) a campaign against criminal abortion be undertaken, (8) adequate social assistance to expectant mothers be provided, and (9) the social condition of lower classes be improved.

DENMARK

General Practitioner and Hospital Physician Change Places.—Dr. H. J. Svendsen, a general practitioner of 14 years standing in a rural district, and Dr. E. K. Leth, who is on the permanent staff of a general hospital, agreed to swap jobs for a month. They prepared themselves for this venture by several meetings at which they initiated each other into the respective mysteries of their jobs. Both emerged from the experience with enhanced respect for each other's calling. In *Yngre læger* for July 17, Svendsen tells how restful it was to have regular hours of work and after a busy day to subside into a chair feeling free to read, meditate, or take a nap without fear of the telephone or a knock on the door. Modern narcosis was all new to him, and he reveled in enhancing his knowledge of minor surgery and in learning how to knot a suture with a needle-holder without using his fingers. Taking down case histories, with the round next morning of the chief in mind, was a bit strenuous at first. He also learned that palpation of the breasts was just as important as stethoscopic examination of the heart and lungs. His sympathy was enlisted for the hospital physician who waxes indignant over patients with furunculosis sent to hospital as acute emergencies. He added rather ruefully that his general practice patients did not seem to appreciate his efforts to bring his knowledge of medicine up to date by this exchange as much as he did.

Dr. Leth in his turn rejoiced over what he had learned by plunging into a country practice. The value of the experiment was enhanced by the conferences he held once or twice a week with Dr. Svendsen to exchange notes. His greatest gain was the result he acquired for a well-organized practice under primitive conditions. The best part of the experience was visiting patients in their homes, but it was difficult to diagnose and treat without x-ray and laboratory support. Another problem was the choice of drugs, with an eye not only on their efficacy but also on their cost.

Tetanus.—Two articles in *Nordisk medicin* for July 24 indicate that Denmark continues to be troubled by tetanus in spite of advances in its prevention. The first comes from Dr. Poul Riis who found that 10 of the 88 nonneonatal cases of tetanus admitted to hospital were due to infection of chronic ulcers of the legs. Apparently chronic varicose ulcers have become more frequent causes of tetanus in recent years, for a study in 1912 showed 313 nonneonatal cases to include only 10 in which chronic leg ulcers were to blame, and another study in 1945 yielded 15 such cases in 527 observed in the 10-year period 1932-1941. Riis suggested that the

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The items in these letters are contributed by regular correspondents in the various foreign countries.

relative scarcity of such cases now may reflect the growing efficiency with which tetanus prophylaxis is carried out. He concluded that, even so, it would be well to immunize patients with chronic leg ulcers against tetanus as a routine measure. In another article, Andersen and Kjaer reported two patients with moderately severe tetanus successfully treated with meprobamate. They urged the admission of such patients to hospitals with special knowledge of the disease and equipment to treat it.

Salmonellosis.—Röjel and Bang in *Ugeskrift for læger* for July 24 reported an explosive outbreak of acute gastroenteritis that involved 46 patients and 59 members of the staff of a provincial hospital in November, 1956. It killed two of the patients and necessitated the admission of 25 of the staff to hospital. Among the suspected articles of food was a mayonnaise of which all had partaken and which was found to contain 100,000 Salmonella typhimurium per milliliter. The incubation period ranged from 12 to 40 (average 24) hours. Most of the patients had a high fever which subsided after a couple of days. The duration of fever was much the same whether the temperature was high or moderate. It lasted less than 6 days in 19 patients, and in 6 it lasted 7 to 11 days. Apart from the two deaths there were no complications, but it was remarkable how ineffective the antibiotics penicillin, chloramphenicol, and oxytetracycline given singly or combined were.

Traffic Accidents.—Several original articles in *Ugeskrift for læger* for July 3 were about traffic accidents. The first dealt with the five-year period 1947-1951 when over 30,000 persons were admitted to hospital for acute traumatic brain lesions, with a mortality of 4.1%. The accidents responsible for these lesions were classified according to whether they were due to traffic or not, the traffic accidents in their turn being classified according to whether they were due to bicycles, motor cars, motorcycles, etc. Here the bicycles came first, the motor cars second, and the motorcycles third, with the horse far down on the list. The second article dealt with two five-year periods, 1947-1951 and 1952-1956. The number of acute traumatic brain lesions treated in the neurosurgical departments of the hospitals in Copenhagen showed a marked rise even in this brief period. Another article was concerned with 691 deaths from traffic accidents in 1955. In only 182 of these was a legal autopsy performed. It showed that 36% of the patients who were dead on arrival presented signs of aspiration of blood, mucus, or gastric contents into the respiratory passages, whereas this was the case with only 28% of those who were alive on admission and who died later. This indicates the necessity for keeping the respiratory passage clear during transport.

INDIA

Environmental Sanitation.—According to a report in *Antiseptic* (June, 1958), the National Water Supply and Sanitation program inaugurated by the government in 1954 envisaged the provision of a safe water supply and adequate drainage arrangements for the entire country in the course of a few years. The program comprises giving technical and financial assistance and supplies of materials and equipment imported from abroad to the various state governments. During the first Five-year Plan period, 196 water supply schemes and 58 drainage schemes were initiated. About 30% of the funds available were set aside for rural and the rest for urban schemes; 258 urban and 134 rural schemes are now in various stages of development.

In the last 10 years, great stress has been laid on the creation of a suitable organization both at state and federal levels for planning and executing public health engineering works, and a Central Public Health Engineering Organization has been set up, to which five consultants from the United States are attached. The training of engineers and auxiliary personnel in public health engineering has come into prominence during this period, and the health ministry has given an added impetus to this aspect of the program by providing about a million dollars in the second plan. Under this program, since the beginning of the second plan, 200 candidates sponsored by the state governments have been trained at the All-India Institute of Hygiene and Public Health, Calcutta, at the Engineering College, Madras, and at the Delhi Water Works. The Indian Council of Medical Research has also stimulated research in the field of environmental sanitation, and a number of field research projects have been set up under its auspices. International agencies helped to establish field research projects.

Prednisone in Diphtheritic Laryngeal Obstruction.—Sami and Sinha (*Indian Journal of Pediatrics*, vol. 25, April, 1958) used prednisone to treat laryngeal diphtheria with obstruction. The main problems in laryngeal diphtheria are mechanical obstruction to the airway and the high degree of toxemia. Tracheotomy performed to overcome the obstruction is associated with serious hazards. As prednisone is more potent than cortisone and has far less side-effects, the authors tried it in such patients with encouraging results. For prednisone to be of benefit, however, survival for 12 to 18 hours is necessary. In severely ill patients with marked cyanosis and other signs of acute laryngeal obstruction, tracheotomy must be resorted to.

In the authors' series, 12 patients with laryngeal diphtheria with varying degrees of obstruction were treated with prednisone, and the results were compared with another group of 12 who did not receive

CORRESPONDENCE

USE OF CARBON TETRACHLORIDE BY HAIRDRESSERS

To the Editor:—In recent months, two persons have been encountered with symptoms, signs, and laboratory data characteristic of carbon tetrachloride intoxication. Both patients were professional hairdressers employed in motion picture and television production. Although one acknowledged having used carbon tetrachloride to remove house paint splattered on his skin during a "do-it-yourself" project, both admitted its regular use in the course of their daily work.

Inquiries revealed that this substance is used frequently by many theatrical makeup artists and hairdressers, especially those who work with wigs. It is used by the former, and by actors and actresses who do not have professional assistance, chiefly to remove the spirit gum adhesive used in applying such "prostheses" as false noses, ears, mustaches, beards, and eyebrows. Hairdressers rub a cloth or cotton wad saturated with carbon tetrachloride over the hair to remove any oily or dusty films that appear to diminish its luster under the theatrical lights. This is done most frequently in preparing a theatrical wig for use, but on occasion it is applied while the wig is being worn or even when grooming an actress' own hair.

Some nontheatrical hairdressers also use carbon tetrachloride, although much less frequently, to remove from hair about to be tinted any oily film that might cause uneven absorption of the dye. Carbon tetrachloride is an ingredient of certain "dry shampoos."

The toxic potentialities of carbon tetrachloride and the rather marked variation in individual susceptibility to its effects are well known. It has been amply demonstrated that its toxicity is considerably enhanced by dietary irregularities and ingestion of alcohol, both of which are not rare in theatrical circles. The application of this material to the face and about the head facilitates inhalation of its vapor and presents obvious dangers to the subject as well as to the hairdresser himself.

Less toxic agents should be substituted for carbon tetrachloride used in this way, and patients presenting the vague signs and symptoms characteristic of mild or chronic carbon tetrachloride intoxication should be interrogated about the possibility of exposure in this manner.

Leon J. Warshaw, M.D.
Paramount Pictures Corporation
1501 Broadway
New York 36.

MEDICAL FILM REVIEWS

Cystectomy for Ovarian Dermoids: 16 mm., color, sound, showing time 25 minutes. Prepared in 1958 by Phil C. Schreier, M.D., and Albert M. Alexander, M.D., Memphis, Tenn. Procurable on loan from Phil C. Schreier, M.D., University of Tennessee, 894 Madison Ave., Memphis 3, Tenn.

This film emphasizes that with virtually all ovarian dermoids the tumor can be resected and the ovary preserved. Also, it is emphasized that the ovarian capsule over the tumor may have primordial follicles in it. In other words, no matter how thinned out the ovary may seem to be, there has been no loss of ovarian substance, and as much as possible of this thin capsule should be preserved. The film shows resection of several cysts, one in a girl who otherwise would have been desexed at an early age had it not been possible to resect the tumor. Another patient had a cesarean section a year or more after cysts had been resected from each of her ovaries. It was thus possible for the film to show the appearance of these ovaries after resection. The sound is good, and the color is excellent. This film is unreservedly recommended to any audience concerned with gynecologic surgery and could also be shown with profit to medical students and perhaps to nurses.

For the Love of Life: 16 mm., color, sound, showing time 13 minutes. Produced in 1957 by Atlas Film Corporation, Oak Park, Ill., through a grant from the American City Bureau. Procurable on rental ($5.00) or purchase ($100) from American Hospital Association, 18 E. Division St., Chicago 10.

The purpose of this film is to present the hospital to the community and show its function and operation within that community. It gives the public an idea of the various departments and the work involved and the people needed and employed to do this work. In a short period, it covers graphically the scope of various surveys and makes it clear to the community why the hospital is such a complex operation and needs its support. It is recommended for lay groups, such as civic groups and service organizations, and also could be used by members of the medical profession when they are asked to participate in a fund raising campaign. To a lesser extent, the film could also be used for recruiting hospital personnel.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

The "Sitosterols": Variability of Serum Cholesterol Levels and Difficulty of Evaluating Decholesterolizing Agents. A. H. Levere, R. C. Bozian, G. Craft and others. Metabolism 7:338-348 (July, pt. 1) 1958 [New York].

The authors discuss factors in the use of plant sterols as a means of lowering human serum cholesterol levels, which may be responsible for contradictory reports on the basis of studies on 25 patients who were followed up without therapy for from 9 to 23 months. All the patients had coronary artery disease, with and without hypercholesterolemia, and were without clinical or laboratory evidence of diabetes mellitus, nephrosis, biliary cirrhosis, hypothyroidism, or familial hyperlipemia. The patients were from the cardiac clinic of the 4th medical division (New York University) of Bellevue Hospital Center, New York. They were 50 to 75 years of age, ambulatory, and lived relatively simple, routine, and sedentary lives. Dietary histories were taken, and it was found that the food consumed was relatively constant, although it was not controlled by the authors. These patients were seen at 2-to-4-week intervals. Nine of the 25 patients, after a control period of 9 to 22 months, then received daily 15 to 25 Gm. of sitosterols, divided into 3 equal portions and taken immediately before meals for 9 to 30 weeks. Seven other patients, without the long control period, received sitosterols in similar fashion and in comparable amounts. The serum cholesterol levels were determined in true duplicate by the Schoenheimer-Sperry technique, as modified by Sperry and further modified by the authors.

In commenting on the results that are recorded in tables, the authors point out that the percentage variation from the mean among hypercholesterolemic patients was as great as +39 to −33%. Even in the normocholesterolemic group, the patients studied exhibited wide deviations. It was also found that, for long periods of time (4 to 6 months), the serum cholesterol values might be relatively stable and vary only within narrow limits. The mean values for these stable periods were often significantly different from the mean for the entire control period. The data on the 9 patients with prolonged control periods showed that there had been a decrease in the mean cholesterol value for the treatment period as compared with the mean for the entire control period in 7 of the 9 patients. However, this is more apparent than real if one considers the wide variation in values which produced these means. The magnitude of fluctuations appears to increase with the degree of hypercholesterolemia. The fluctuations complicate the interpretation of studies of serum cholesterol-lowering agents, even when control periods are more than 1 year in duration. Results ascribed to therapy must be clearly beyond the variations present without therapy. Infrared spectrums and melting point determinations indicate that the present sitosterol preparations are not identical, either chemically or physically. Studies, during which soybean-oil and tall-oil sitosterols were given to patients with coronary artery disease, with and without hypercholesterolemia, resulted in no decrease in serum cholesterol levels that could confidently be attributed to medication.

Chickenpox and Its Repercussion on Immunology in Primary Infection with Tuberculosis. P. de Vilhena Moraes. Rev. Hosp. clín. 13:225-228 (May-June) 1958 (In Portuguese) [São Paulo, Brazil].

Thirty-four children with pulmonary tuberculosis hospitalized at the Hospital Infantil of São Paulo were observed during an epidemic of chickenpox. The patients were between the ages of 10 months and 4 years except 2 who were 11 and 12 years old. The patients had been under treatment with streptomycin and isoniazid for a period varying from 2 weeks to 6 months when chickenpox developed. The treatment was continued without interruption during the course of development and after the control of the chickenpox. Roentgenologic examination of the chest was made before, during, and after the course of the chickenpox and at intervals of 1 or 2 months after the patient's recovery. The Mantoux reaction, elicited by an intradermal injection of 0.10 cc. of a 1:1,000 gross tuberculin solution recently prepared, was used for determination of skin sensitivity. The results of the test were compared with those obtained at the start of anti-

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The place of publication of the periodicals appears in brackets preceding each abstract.

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carcinomas of the breast with invasion of the thoracic wall in elderly women, and in patients with visceral metastases. Stilbestrol is given in daily doses of 15 mg. for as long as the disease responds to the treatment. When the effects of castration stop, cortisone in daily doses which vary between 200 and 300 mg. produces significant remissions. When the good effects of hormonal treatment stop, total bilateral adrenalectomy or hypophysectomy is still of some benefit to the patient. Hormonal treatment is not a cure of carcinoma of the breast in the advanced stages. It is indicated only in cases in which either surgery or roentgentherapy cannot be carried out.

PATHOLOGY

Sarcoma of the Mammary Gland. R. J. Botham, J. R. McDonald and O. T. Clagett. Surg. Gynec. & Obst. 107:55-61 (July) 1958 [Chicago].

A study of the clinical and microscopic features of sarcoma of the breast was undertaken to clarify such factors as the history and physical findings, gross and microscopic pathological observations, clinical course, and appropriate therapy associated with this type of primary neoplasm of the breast. The records of all patients seen at the Mayo Clinic during the 50 years between 1907 and 1956, inclusive, whose diagnoses contained the term "sarcoma" in reference to a tumor of the breast, were selected for study. The histories and the operative and pathological reports were reviewed. There were 34 cases in which the microscopic features of the primary lesion were consistent with a diagnosis of true primary sarcoma of the breast. The mean age of the 34 patients was 49.2 years, the extremes being 21 and 69 years. There were 33 women and 1 man in the series. The authors discuss the diagnosis, history and physical findings, gross and microscopic pathological aspects, clinical course, and treatment of primary mammary sarcoma.

The authors conclude that true primary sarcoma of the breast is a distinct clinical and pathological entity and that this lesion may contain one or more types of malignant mesenchymal tissue intimately admixed with malignant epithelial tissue. Associated palpable involvement of axillary lymphatic vessels is of little significance in determining the appropriate surgical therapy or ultimate clinical course associated with sarcoma of the breast. True primary sarcoma of the breast rarely, if ever, metastasizes to regional lymph nodes. Primary sarcoma of the breast, although occasionally associated with ulceration, rarely invades the overlying integument, but it is capable of metastasizing, and often does metastasize, primarily by way of the blood stream, most frequently to the lungs. The authors believe that simple mastectomy, with excision of the underlying pectoral musculature, is adequate therapy for sarcoma of the breast not containing a malignant epithelial component, and that primary sarcoma of the breast which also contains demonstrable carcinoma in fresh-frozen sections should be treated by radical mastectomy. They are convinced that wide local excision, when feasible, is indicated in the treatment of recurrent sarcoma of the breast.

PUBLIC HEALTH

Mass Prophylaxis of Epidemic Streptococcal Infections with Benzathine Penicillin G: II. Experience at a Naval Training Center During the Winter of 1956-57. R. B. McFarland, V. G. Colvin and J. R. Seal. New England J. Med. 258:1277-1284 (June 26) 1958 [Boston].

This program of streptococcic prophylaxis was carried out on the male-recruit population at the United States Naval Training Center, Bainbridge, Md., from Oct. 29, 1956, to May 9, 1957. A total of 12,858 men received an injection of benzathine penicillin, and 237 (1.8%) were excused because of a history of allergy to penicillin. Those recruits in each company with an even number for the last digit of the service number were given 600,000 units of penicillin, and those whose last digit was an odd number received 1.2 million units. Throat cultures were taken immediately prior to injection, again during the 8th week, and during the 10th and final week of training. Only 3 recruits among the 20,000 men at risk had rheumatic fever during the period from November, 1956, to June, 1957. One case was a recurrence which developed before the patient's company received prophylaxis. The second patient had had a sore throat 5 days prior to entering recruit training, and rheumatic fever developed in the third patient 2 months after his prophylaxis. Thus, only 1 of the 3 cases occurred after the single prophylaxis and might have been prevented by repeated injections.

Of the 13,905 men who were cultured in the 4th week, 294 (2.24%) had positive cultures. In the 8th week 11,965 men were cultured, and 43 (0.36%) had positive cultures. In the 10th week 12,511 men were cultured, of whom 175 were positive. Only 4 of the 141 recruit companies had over 10% of the cultures positive for group A streptococci in the 4th week, and only 4 other companies had over 10% positive in the 10th week. Of the 4,568 cultures taken from men who had received 600,000 units, 14 were positive at the 8th week, while in the 4,571 men who had received the 1.2-million-unit dose 5 were positive. At the time of the 10th-week cultures there were essentially the same number of positive cultures in both groups. In the period from 42 to 48 days after injection there were 54 positive cultures from the group who had received 600,000 units and 46 positive cultures among those who had received 1.2 million units. Under the conditions existing at the time of survey, the larger dose would seem to offer little advantage over the smaller dose in either degree or duration of infection.

BOOK REVIEWS

Modern Trends in Gastroenterology (Second Series). Edited by F. Avery Jones, M.D., F.R.C.P. Cloth. $16. Pp. 416; 23, with 143 illustrations. Paul B. Hoeber, Inc. (medical book department of Harper & Brothers), 49 E. 33rd St., New York 16, 1958.

This compilation reflects the advances made in gastroenterology. There is no attempt to be comprehensive, the selection of subjects being determined by progress and current interest shown in basic physiological research, clinical pathological entities, therapeutics, and diagnostic procedures. The reviews of collagen disease, Peutz-Jegher syndrome, and carcinoid tumors, with coverage of the clinical, chemical, physiological, and pathological advances made in the latter, are excellent. The advances made in diagnostic laboratory procedures, exposing new horizons in the field of cancer detection by exfoliative cytology, the use of the maximal histamine test for anacidity necessitating critical reappraisal of conditions associated with achlorhydria, and the position of radiographic cholangiography, are of great interest and well presented. The chapter dealing with the anatomy and pathological physiology of the lower esophagus and the chapters on the blind-loop syndrome, massive resection of the small intestine, and hepatic failure are instructive and of practical interest. The handling of the present position of ACTH, corticosteroids, and antibiotics is timely and includes appropriate words of caution as to the use of these agents. Reviews on peptic ulcer, ulcerative colitis, regional ileitis, steatorrhea, and selected protozoan and helminthic infestations are skillfully written. With all the chapters of such high caliber, this volume should be a worthy addition to many physicians' libraries.

Signs, Symptoms and Treatment of Certain Acute Intoxications. By William B. Deichmann, Ph.D., Professor and Chairman, Department of Pharmacology, University of Miami, School of Medicine, Coral Gables, Florida, and Horace W. Gerarde, M.D., Ph.D., Head Toxicologist, Esso Research and Engineering Company, Medical Research Division, Linden, N. J. Second edition. Cloth. $3.75. Pp. 154. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1958.

This pocket reference book is intended as a reference for the treatment of acute intoxications by interns and residents in hospitals and poison control centers. The new edition has been expanded to include 400 additional entries and new sections on first aid and artificial respiration. No attempt has been made to include well-known chemicals, but information is provided on compounds that have been described in the most recent literature. Part 1 deals with first aid, general suggestions for treatment, drugs and dosages for treatment of intoxications, and supportive treatment; part 2 gives an alphabetical listing of toxic substances, with brief summaries of signs, symptoms, and treatment of acute intoxications. References to the literature are provided. In order to provide summary information, the authors have sacrificed details of treatment and special problems in many instances. While a handbook of this size is useful, the abbreviated nature of its content limits its value. Medical personnel would best be advised to use this handbook only as an adjunct to existing textbooks on the treatment of accidental or intentional intoxications.

Microbiology and Epidemiology. By La Verne Ruth Thompson, R.N., M.A., M.S. Fourth edition. Cloth. $6. Pp. 581, with 110 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W. C. 2, England, 1958.

When a textbook reaches the fourth edition, it reflects the merit of the contents as well as a message for its readers. This valuable and informative book, in its present edition, keeps abreast with the research in the past years concerning not only the diagnostic procedures in microbiology but the advancing concepts in the field of epidemiology. The author indicates that the book is written primarily for the student whose chief interest lies in the field of health and welfare instead of bacteriology per se, but the reader should also enjoy a comprehensive survey of the subject. The author presents the subject of microbiology and epidemiology in a precise, succinct, and readable manner that holds the interest of the reader. Section 1 deals with microorganisms, their nature and response to environment, and their influence on their surroundings. Section 2 deals with body defenses and the various means of preventing and controlling infections. The illustrations and the text are clear and easy to follow, and at the end of each chapter references to the current textbooks and periodicals are given. There is a glossary of the important terms used in the text, and the index is adequate. Although the book does not give details of technical procedures for the identification and isolation of bacteria, it should be exceedingly beneficial to the student in his early training in bacteriology and epidemiology, as well as to the bacteriologist.

sylvania assembly voted 2,000 pounds to Philadelphia, on condition that the city itself by popular subscription raise a like amount.

On the reasoning behind Hill-Burton, the report says:

"The underlying social philosophy of the program under Title VI of the Public Health Service Act is that the health of the nation is a national resource and that Federal leadership and financial encouragement are warranted and necessary in establishing a systematic network of facilities for hospitals and medical facilities. For this purpose, comprehensive planning by the states themselves is regarded as essential, based on careful inventories of existing facilities, while local initiative and local financing must launch specific projects in accordance with the state plan, if Federal assistance is to be provided."

As of 1956, the survey found that the general hospital bed ratio is 3.37 per 1,000 population, or about 75% of the total planned by the states and 73% of what the states regard as their actual need. Mental facilities, with 2.78 beds per 1,000, are registered as only 55% of the total need but 78% of construction planned by states.

Tuberculosis hospitals have 0.52 beds per 1,000, or 70% of the total need and 88% of the planned objective. Chronic care facilities show the greatest deficit, according to Hill-Burton—0.26 acceptable beds per 1,000, or 23% of the total planned and 13% of the estimated need.

Under a heading Unfinished Tasks, the report declares: "Since the adoption of this Act in 1946 much has been achieved in the planning and construction of health facilities, yet the broad purpose has by no means been carried out.

"Adequate facilities of many kinds are still lacking if a high quality of medical care is to be provided for all the people.

"Changes in modern therapy and shifts in population make continued planning essential. The physical needs must be reappraised with respect to geographic distribution, and functionally by the interrelating of several types of facilities for common purposes.

"Standards are essential for systematic planning for health facilities in order to determine what is adequate."

PHS PROPOSES DEFINITIONS FOR NURSING HOMES

Public Health Service has started work on model legislation and regulations for nursing homes for the aged, which it hopes will serve as a guide to the states in revising their laws or enacting new statutes. The study was recommended by the Association of State and Territorial Health Officers and the National Conference on Nursing Homes for the Aged.

In a first step, PHS has drawn up and circulated to interested groups a proposed numbering and definition system on the theory that current terminology used to refer to nursing homes is confusing. "The same term often means different things to different people and makes communication at a national level difficult and often impossible. T' fore it is proposed to use numbers to refer to various kinds of facilities," PHS said.

The proposed system:

Series 210 Facility—A facility whether operat for profit or not, including those run by the stat other political subdivision, which provides fo period of not less than 24 hours a day intermed care for two or more individuals. Such care is fined as nursing care, diet therapy, physical ther occupational therapy, recreational therapy, and l social group work and social casework.

Series 310 Facility—A facility, profit or nonpr operated for the purpose of providing nursing c Such care is that given by or under the supervi of a registered nurse.

Series 410 Facility—Profit or nonprofit facility viding personal care. This is defined as such as ance, with the every day essential activities of liv as does not require the services or supervisio a registered nurse.

NEW TYPE OF TOURNIQUET FOUND SUCCESSFUL

Tests in operating rooms at Walter Reed A Hospital for more than [illegible] have proved Howard-Bailey pneumatic [illegible]quet as comple reliable and trouble-free. [illegible] is reported by Sterling J. Ritchey, assistant chief of the orthop section at the hospital, writing in the current is of the *Armed Forces Medical Journal.*

The simply constructed tourniquet consists c blood pressure pneumatic arm cuff enclosed i removable cloth sheath. The sheath is sewn at edges to a strip of flexible metal fireplace screen size of the cuff. Tube outlets of the tourniquet bl der are cut off and "cold patched" with auto tu patches. An auto replacement valve stem also cold-patched to the center of the bladder as a i ing and deflation valve.

Colonel Ritchey explains that the tournique inflated in the same way as an automobile tire, loading tip being applied at a predetermined pr sure. Because of its broad steel mesh support, tourniquet is extremely comfortable and much s pler to apply.

MISCELLANY

The Veterans Administration is reminding ph sicians and hospital administrators that it cann pay the bills for care of Spanish-American War ve erans in non-Va hospitals. Comments the VA: "Sin few Spanish-American War veterans have disabi ties that are service-connected for purposes of ho pital treatment, the number eligible for care i non-VA hospitals at VA expense is extremely lim ited."

Office of Civil and Defense Mobilization has co tracted with the National Broadcasting Compan for a 10-program series titled "Ten for Survival and it will be shown over the 32-station education television network. The first will be shown Oct. 2 The series, according to NBC, will be devoted the problems of man's adaptation to the nuclear ag